June 1941

CONSUMERS' RESEARCH BULLETIN

General Bulletin Number

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Editors

F. J. SCHLINK R. JOYCE

Technical Staff

R. JOYCE E. W. CHENEY

THOMAS W. ROBERTS

Technical and Editorial Assistants

HELEN P. ALLEMAN GRACE MATTHEWS

C. P. CHENEY

This number is one of 4 *Bulletins* issued during the year by Consumers' Research which are not confidential. This *Bulletin* may be freely discussed with friends. We hope that you will use the opportunity to show them what CR is doing for consumers. ¶The *General Bulletin* is available not only to individuals, but to libraries, schools, and other groups, at $1 for the subscription year October through June. The next non-confidential issue will be the October 1941 number. ¶Responsibility for all specific statements of fact or opinion at any time made by Consumers' Research lies wholly with the technical director and staff of the organization. ¶Please send notice of any change of address at least one month before it is to take effect, accompanying your notice with statement of your previous address. Duplicate copies cannot be sent to replace those undelivered through subscriber's failure to send advance notice, except at the regular price for orders of such material as back issues. N.B.—For a detailed account of CR's early history, policies, and information [illegible] the answering of special inquiries about commodities, subscribers are urged to read the *Introduction to Consumers' Research*, which is sent to anyone without charge.

Symbols used to indicate sources of data and bases of ratings:

A—recommended on basis of quality
AA—regarded as worthy of highest recommendation
B—intermediate with respect to quality
C—not recommended on basis of quality
cr—information from Consumers' Research's own tests or investigations
1, 2, 3—relative prices, 1 being low, 3 high. ¶Note that price and quality are completely differentiated in CR's listings; a *quality judgment is independent of price*.
40, 41—year in which test was made or information obtained or organized by the staff of Consumers' Research

Off the Editor's Chest

TO WHAT extent should one believe statements by dealers relating to the products they sell? This is a question that often perplexes consumers, judging from the letters CR receives in which they relate their experiences in trying to buy a certain recommended product, often of a well-known, nationally distributed make.

In one specific case, the manufacturer of an electric iron tested by CR and given an *A* rating was alleged by a midwestern dealer to have conceded (in contradiction to CR's finding) that the iron was so unsatisfactory that the guaranty had been withdrawn, and the maker had even taken back irons that had been sold. "How did you come to recommend this iron?" asked a subscriber, to whom the dealer had told this false but apparently plausible story. CR took the trouble to investigate the facts of this case and was informed by the manufacturer in writing that the dealer's assertion was not only incorrect, but that the iron had been exceptionally free from troubles and complaints during the seven years it had been marketed and that "all sales of this iron were fully covered by our standard guarantee provisions." Assuming the truth of the subscriber's report, the dealer had lied about this iron, for business reasons.

Equally typical of misrepresentations of consumers' goods are rumors charging that CR receives compensation in return for recommending a certain product. Several times a year, CR receives a letter from a subscriber reporting such rumors, and on various occasions in the past we have discussed them in print, showing that they were irresponsible, untraceable to the original source, or withdrawn when the person repeating them was pressed for proof. (Some, indeed, involved products which CR had never tested, while others were of products rated *C. Not Recommended*—and no manufacturer or dealer has yet intentionally accused anyone, so far as we know, of accepting remuneration for that type of rating!)

The average person will, unfortunately, accept such information as though it were valid and needed no checking, because it does not occur to him that a dealer or salesman would be guilty of downright misrepresentation or falsehood about so simple a matter. Confronted by such a situation, the consumer's best attitude is to assume, as a defensive measure, that where his purchasing interests are affected, he should rely on no statement that is not made responsibly and in writing. (This is especially true when the dealer's statement conflicts in any essential with information the consumer has obtained from a reputable and responsible source which does put its statements in writing—whether that source be the American Medical Association, the American Dental Association, or Consumers' Research.)

As most salespeople know, whether a merchant's or manufacturer's statement at the point of sale can be believed implicitly depends in some measure upon the degree to which his interests are affected or a sale is facilitated by his statement or claim. An "admission against interest," as the lawyers term it, is always to be given considerable weight. Such, for example, is a dealer's admission that he has had to do an unusual amount of servicing on a certain washing machine or radio receiver. If he makes the same claim, however, about a competitor's product or a product that he himself *used* to sell, then the claim should be received with a degree of skepticism, for it is in favor of his interest, and it is perhaps safe to assume that the likelihood of its being false, or at least distorted, is greater than the likelihood of its being true.

* * *

We do not intend to imply, in the foregoing, that merchants always lie and that consumers always tell the truth. It is merely that the temptation to misrepresent, when the statement is of a kind or in a form that is not easily or conveniently verified, is too great for many dealers to resist, especially when the dealer has been up against unusual sales resistance, when the consumer knows, for example, of tests that have shown that a certain vacuum cleaner is considerably less efficient in dirt removal than another. It's all too easy for the dealer to try to get around such difficulties by suggesting that CR received $10,000 from the maker of the vacuum cleaner or washing machine for an especially good rating, whereas a competitor did not "come across." A sharp demand for the name and address of the person who gave him that information will effectively stop that line of sales argument, and any consumer who declines to accept such an unsupported and undocumented oral statement and calls for proof, will be doing a service not only to the dealer and to merchants in general, but to the many other consumers with whom salesmen leaning to sharp practices may deal in future.

Consumers' Research Bulletin, issued monthly, except during July and August, by Consumers' Research, Inc. Editorial and Publication Offices, Washington, N.J. Single copy 30c. Subscription price $3.00 per year, U.S.A.; Canada and foreign, $3.50. Entered as second-class matter November 9, 1934, at the Post Office at Washington, N.J., under the act of March 3, 1879. Copyright, 1941, by Consumers' Research, Inc., Washington, N.J. ★★ Printed in U.S.A. ★★ Consumers' Research *General Bulletin* is on file in many Public Libraries and is indexed in *Industrial Arts Index*.

Electric Refrigerators

GENERALLY speaking, the amount one has to pay for the electricity used to operate an electric refrigerator during its life is about equal to the price of a new refrigerator. There is, however, considerable variation between refrigerators. In spite of large reductions in average operating costs, due to improvements in design and insulation in recent years, some makes of electric refrigerators even now cost as much as 50% more to operate, than others. The housewife who likes to spend her money carefully should, therefore, take this into consideration when buying a refrigerator—else she and her family will be out of pocket the substantial amount of $6 or $8 a year over a long period of years.

There are also factors other than economy in use of electricity that one should consider when buying a refrigerator, though current consumption is easily the most important single factor, in practice. Is the refrigerator quiet in operation? Does the electrical insulation meet standard safety requirements? Is the finish, inside and out, easy to clean, and will it remain in good condition? Are the hinges, latch, and shelves made to give long service? Is the food compartment of a size suitable for one's needs? Has it the conveniences demanded by one's fancy?

Tests by Consumers' Research answer the questions on relative operating costs, noise, safety of electrical insulation, serviceability of finish, and general quality of construction for the most popular size of refrigerators of the most important makes. The brands in CR's test, according to published trade statistics, comprise more than 4/5 of the total number of mechanical refrigerators now being sold in the United States.

View in test chamber showing meters for measuring consumption of electrical energy (kilowatt-hours), and clocks connected so as to register total running time of the refrigerator motors.

The 6-cubic-foot refrigerator has become the most popular, but size is, of course, to be determined after considering the number of members in the family, buying habits, experience with previous refrigerators, and price. The larger the refrigerator the more it costs, and operating costs, too, are likely to increase a little with size. As for gadgets, the housewife should remember that the modern refrigerators all do a good job of preserving food, and that "aerators," "reversible humidifiers," or magical shelves are really not the revolutionary, indispensable inventions the advertisements commonly try to make her think they are. Each year for many years there has been a new crop of exclusive, miraculous features to replace those that only a year before seemed (in the advertising) to have set up a changeless goal of ultimate perfection. Addition of a few of these gadgets to a refrigerator usually increases the cost 20% or 30%, and many people will not find them worth the price. Their chief function is to help the salesman to "sell-up," that is, to induce the customer to buy a higher-priced model than she intended to. (Economically, their effect in raising the price the consumer will pay is exactly parallel to that which a fancy box has in raising candy from 40c to $1 a pound at retail.) Some dealers are so reluctant to sell economy or stripped models (which give them a lower profit) that they may not carry them in stock or even show circulars describing them.

Two years ago, the big advertising development in the household refrigerator field was the *Frigidaire Cold Wall*, used in some of the higher-priced models. In the colorful, never-modest language of the advertiser, it was hailed as the "New! Amazing Discovery," the "Modern Food-Keeping Miracle," the "Sensational New-Type Refrigerator." In more prosaic terms, the "New Amazing Discovery" was a refrigerator compartment in which it was possible to maintain a higher-than-usual humidity. This higher relative humidity made it less necessary to cover fruits and vegetables to prevent their drying out when stored for considerable periods of time. Other manufacturers in some instances have copied Frigidaire; Crosley provides "Moist-Kold" in certain models; Kelvinator has a glass-enclosed "Cold-Mist Fresheners"; Stewart-Warner has a "Moist-Cold" compartment, and, to go Frigidaire one better, installs in it a sterilizing lamp. With this arrangement Stewart-Warner salesmen will assure you perhaps that you can keep blueberries for months. But do you really want to keep blueberries for months, and *should* you do so? Among the current innovations are refrigerators with colored interior trim. Other advertising miracles are the "Tru-Temp" of Westinghouse, and the "Handefroster" and "Night-Watch" of Norge. "Tru-Temp" is an improved, more accurate temperature control used

by Westinghouse since 1939. The "Night-Watch" of the Norge gives automatic defrosting each night. Other innovations are "Polar Lights," "Len-A-Lights," "Trip-loks," and "Aero Spring Hinges." Lest the reader think that she must replace her antediluvian model of refrigerator at once in order to secure the advantages of these modern miracles, it may be explained that "Polar Lights" and "Len-A-Lights" are names merely for interior lights that illuminate the freezing compartment of the refrigerator as well as the food storage space, and the "Trip-loks" and "Aero Spring Hinges" are names merely for a latch and a hinge used on some of the Westinghouse refrigerators—nothing very far out of the ordinary.

Engineer taking readings on the multiple-recording potentiometer used in the refrigerator tests, for determining the temperatures of the room and of the refrigerator food-chambers.

In CR's tests of refrigerators, operating costs were determined by a standardized procedure modified from the method described in Household Electrical Refrigerator Standards of the National Electrical Manufacturers Association. The temperature of the room in which the refrigerators were tested was accurately controlled at 80°F and at 110°F instead of at 70°, 90°, and 110°F specified in the N.E.M.A. standards. By experience, it has been learned that the cost of operating a refrigerator loaded with food and used under average conditions in a home will often be close to the operating costs determined under test conditions in a room held accurately and constantly at 80°F.

Comparative operating costs of the refrigerators tested varied from about 90 cents per month for the most efficient refrigerator to about $1.50 for the least efficient one. Westinghouse advertisements recently have claimed an average electrical consumption of 2/3 kilowatt-hour per day. CR's tests support the truth of this claim; the Westinghouse refrigerator in fact had the lowest comparative operating cost of the refrigerators tested. For four of the refrigerators, the tests showed comparative operating costs to be almost identical. Of all the refrigerators rated *A*, the difference in operating costs would probably not exceed 30 or 40 cents a month at 5 cents per kilowatt-hour charged for electricity. Montgomery Ward's refrigerator was the most expensive to operate; catalog claims that the refrigerator is "economical" and "actually equals in every way models selling at $129" surely seemed unwarranted.

Operating costs in the home depend on the way the refrigerator is used. They may be kept to a minimum by setting the controls so as not to produce unreasonably low inside temperatures (44°F should be low enough; for each degree Fahrenheit that the interior temperature is lowered, by adjustment of the regulator or "cold control," the operating cost may be increased by 7 to 12 cents a month), by not permitting a thick ice coat (beyond ¼ to ½ inch) on the cooling unit, and by keeping the condenser free from a heavy deposit of dust. Plate-type condensers, such as used on Westinghouse and, particularly, General Electric refrigerators (being smooth, without fins, and vertical), require much less attention to keep clean and are judged more desirable than the usual type of condensers with fins. Defrosting clocks are only of very limited value as a means of reducing operating costs (see CR's June 1938 *Bulletin*).

The interior porcelain enamel was tested for resistance to staining by food acids. All refrigerators were satisfactory in this test unless otherwise noted in the listings.

All the refrigerators tested had sealed units (motor and compressor in a hermetically sealed container), a method of construction which is now the standard practice of the industry.[1]

Height of bottom of cabinet interior above floor varied for different refrigerators from 13 inches for the *Coldspot*, Sears' No. 106—41326, to 23 inches for the *Crosley S641*. The higher levels are preferred by most users since they call for less stooping.

General Electric LB6C, *Stewart-Warner A601*, and *Westinghouse AS-6-41* were bought for test by CR. *Crosley S641*, *Frigidaire M-6-41*, and *Norge M-623* were lent by the manufacturers for the duration of the test. *Coldspot*, Sears' No. 106—41326, and Montgomery Ward's No. 169—661 were lent by the distributors. The refrigerators were selected at random from regular stock. Kelvinator refrigerators were not tested by CR but were rated on the basis of data from tests made by the very reliable Electrical Testing Laboratories of New York City, submitted directly to CR.

The rating of one gas refrigerator tested in 1939 and ratings of two electric refrigerators tested in 1940 have been briefly repeated, as indicated in the listings, for the convenience of our readers. Small price advances have been announced on some models since the time when they were obtained for test by CR. Prices in different sections of the country may differ $5 to $10 from those listed, because of shipping charges. Listings are in the customary alphabetical order. Ratings are cr41 except as noted.

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[1] Hazards of the various refrigerants were discussed in CR's May 1934 *Handbook of Buying* (tear sheets of which are available at 5 cents, accompanied by ready-addressed, 3-cent-stamped envelope). That discussion is still applicable.

A. Recommended

Coldspot, Sears-Roebuck's No. 106—41326. $134.95 at a retail store. Capacity, 6.2 cu ft; shelf area, 11.8 sq ft. Bottom of cabinet interior, 13 in. above floor, lowest of refrigerators tested. Sealed compressor, rotary type. Cost of operation, about average. Refrigerant was sulphur dioxide.

Frigidaire M-6-41 (Frigidaire, Div. General Motors Sales Corp., Dayton, Ohio) $147.75. Capacity, 6.6 cu ft; shelf area, 13.9 sq ft. Bottom of cabinet interior, 21 in. above floor. Sealed compressor, rotary type. Cost of operation, about average. Refrigerant was dichlorotetrafluoroethane. ¶Next lower-priced 6-cu-ft model, *L-6-41*, at $132.75, had same mechanism, and same volume of storage, but lacked utility storage bin, meat drawer, etc.

General Electric LB6C (General Electric Co., Bridgeport, Conn.) $109.95. Capacity, 6.3 cu ft; shelf area, 11.7 sq ft. Bottom of cabinet interior, 18½ in. above floor. Sealed compressor, reciprocating type. Condenser, plate type (desirable). Cost of operation, about average. Refrigerant was sulphur dioxide. ¶After the test was started, CR was advised by the manufacturer that only limited numbers of this model are to be available; this year's corresponding model is *LB6* at $124.95. The *LB6* has similar mechanism, volume of storage, and shelf area, and should give very close to the same performance.

General Electric LBX6-41 at $134.95, and JB6-41 at $149.95. Condenser, plate type (desirable). Not tested by CR, but claimed by the manufacturer to have the same operating cost as *Model LB6B* tested by CR and rated *A* in the June 1940 *Bulletin*. Cost of operation, about the same as for *Model LB6C* at temperatures up to 90°F; somewhat lower relative cost at higher temperatures.

Hotpoint 320EA63 (Edison General Electric Appliance Co., Inc., Chicago) $114.75. cr40

Kelvinator D6-41 (Kelvinator Div., Nash-Kelvinator Corp., Detroit) $129.95. Rated capacity, 6.7 cu ft; rated shelf area, 11.8 sq ft. Sealed compressor, reciprocating type. Cost of operation, about average. Refrigerant was dichlorodifluoromethane.

Kelvinator S6-41 (Kelvinator Div., Nash-Kelvinator Corp.) $144.95. Rated capacity, 6.7 cu ft; rated shelf area, 11.8 sq ft. Sealed compressor, reciprocating type. Cost of operation, about average. Refrigerant was dichlorodifluoromethane.

Norge M-623 (Norge Div., Borg-Warner Corp., Detroit) $144.95. Capacity, 6 cu ft; shelf area, 10.5 sq ft. Bottom of cabinet interior, 21 in. above floor. Sealed compressor, rotary type. Cost of operation, slightly above average. Refrigerant was sulphur dioxide. Grape juice and grapefruit juice left a dulled surface on interior enamel. ¶Next higher-priced 6-cu-ft model, *M-624P*, at $164.95, had same mechanism, volume of storage, and shelf area, and was similar except it had porcelain exterior instead of the so-called *Norglos* finish.

Philco LX-6 (Philco Refrigerator Div., Philco Radio & Television Corp., Philadelphia) $119.75. cr40

Stewart-Warner A601 (Stewart-Warner Corp., Chicago) $119.95. Capacity, 6.4 cu ft; shelf area, 10.9 sq ft. Bottom of cabinet interior, 20½ in. above floor. Sealed compressor, reciprocating type. Cost of operation, about average. Refrigerant was dichlorodifluoromethane. ¶Next higher-priced 6-cu-ft model, *611*, at $139.95, had same mechanism, volume of storage, and shelf area; had sliding vegetable tray, meat chest, utility compartment, etc.

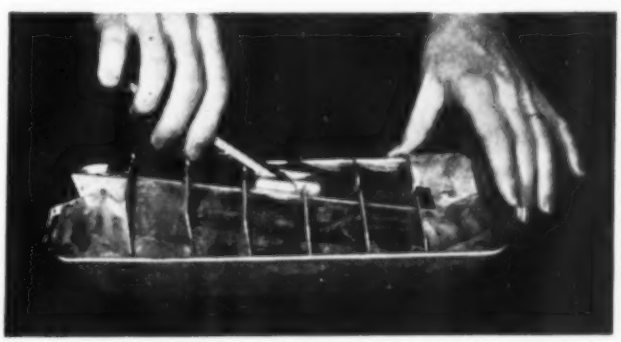
Westinghouse AS-6-41 (Westinghouse Electric & Mfg. Co., Mansfield, Ohio) $119.95. Capacity, 6 cu ft; shelf area, 10.6 sq ft. Bottom of cabinet interior, 22 in. above floor. Sealed compressor, reciprocating type. Condenser, plate type (desirable). Cost of operation, lowest of 1941 refrigerators listed by CR. Refrigerant was dichlorodifluoromethane. ¶Next higher-priced 6-cu-ft model, *S-6-41*, at $129.95, had same mechanism; had sliding-top crisper and deeper defrosting tray, *Tru-Temp* control, etc.

B. Intermediate

Crosley S641 (The Crosley Corp., Cincinnati) $132.95. Capacity, 7.2 cu ft; shelf area, 13.7 sq ft. Bottom of cabinet interior, 23 in. above floor. Sealed compressor, rotary type. Cost of operation, about average. Failed by considerable margin to meet standard requirements for safety of electrical insulation, otherwise would have rated *A*. Refrigerant was dichlorodifluoromethane. ¶Next higher-priced 7-cu-ft model, *SE641*, at $147.95, had same mechanism, volume of storage, and shelf area; had dry-storage bin, thermometer, cold-storage drawer, etc.

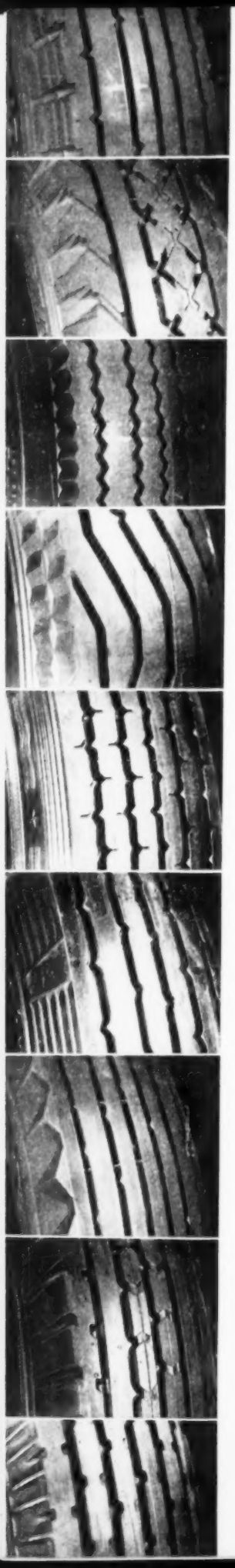
Montgomery Ward's No. 169—661. $89.95 plus freight. Capacity, 6.5 cu ft; shelf area, 11.3 sq ft. Bottom of cabinet interior, 21 in. above floor. Sealed compressor, rotary type. Cost of operation, highest of the 1941 refrigerators tested by CR (over 50% higher than for *Westinghouse* AS-6-41). Refrigerant was dichlorodifluoromethane. ¶Next higher-priced 6.5-cu-ft model, *169-671*, at $104.95 plus freight, had same mechanism, volume of storage, and shelf area; had *Jiffy* tray releases, *Jiffy* ice-cube releases, larger "food freshener," 2 qt-size water bottles, etc.

Servel Electrolux, *The Duchess*, K-600, Gas Refrigerator (Servel Inc., Evansville, Ind.) $259.50. Operating cost was much higher than for good electric refrigerators at typical rates for manufactured and bottled gas and for electricity—23c per therm, 40c per therm, and 5c per kwh, respectively. (For details see CR's June 1939 *Bulletin*, 30c postpaid.) cr39



An easy-releasing ice-cube tray, tried by CR and found convenient—the Shucker Tray, ***priced at $2, manufactured by Inland Mfg. Div., General Motors Corp., Dayton, Ohio. Made of aluminum (or was at least until the recent aluminum shortage) to fit various makes of refrigerators. Presumably will be available in other metal or material if aluminum becomes unavailable.***

Automobile Tires



THE PRESENT trend in the development of automobile tires, as indicated by recent tests conducted by CR, is toward a lighter, stronger, and more abrasion-resistant product. Technological progress by the tire makers and intelligent and consistent application of physical and chemical research to the practical processes of tire making may be considered as the main factors in bringing about these changes. In some cases, however, the amount of woven (not cord) fabric in the tires has been reduced and the adhesion of the fabric layers to one another has been lowered, indicating that some makers attempt cost reductions that are not in line with the general improvements in the industry that have been mentioned.

Synthetic rubber is now beginning to find its way into tires for passenger car use. One tire employing synthetic rubber as the tread material—*Goodrich Silvertown Ameripol*—was included in the present test. Quite possibly the use of synthetic rubber is for the purpose of gaining needed production experience with this material to help meet the difficulties that will arise if the present overseas supply of rubber is cut off. Consumers may, therefore, wish to purchase such tires as an aid to the general defense supply problem, though it may be noted from the listings that the abrasion resistance of the synthetic tread material was appreciably lower than that of natural rubber.

Grades of Tires

Tires are made in a number of grades, but those selected for CR's test were, with two exceptions, the so-called "standard" or "first-line" tires (actually, as a rule, a manufacturers' third-grade tire). Since numerous super and super-super grades, incorporating the latest technical advances, are being made available at higher prices, the "first-line" tires, perhaps as a delayed result of the industry's ill-advised attempt some years ago to sell at artificially fixed, non-competitive prices, are gradually becoming the lowest grade or cheapest tires. For most consumers, a "first-line" tire (i.e., not the real top grade) will, however, be the logical choice. Where especially severe service conditions are to be encountered, or risk of blowout must be avoided to the maximum possible degree, one of the premium or "super" grades may be selected. On the other hand, persons driving less than 5000 miles a year at moderate speeds over good roads may find that their main problem is one of deterioration of tires by weathering rather than by wear. For such persons, especially if they are careful, relatively slow drivers, a lower-priced, so-called "second-line" tire would be the logical choice.

Ordinarily, tires of the size and number of plies supplied by the automobile maker on the car when it was originally sold, should be purchased when new tires are needed. In case of doubt, consult CR's rating of the car in question to determine whether or not the original tires were judged of adequate size for a 5-passenger load. If the car is to be heavily loaded, carrying 4 or 5 passengers plus baggage, or an equivalent weight, or if it is driven under severe road and speed conditions, it may require larger or heavier tires than regularly supplied by the car manufacturer. It should be noted, however, that the riding qualities of the car may be impaired by the use of larger or heavier tires. In general, six-ply tires will decrease riding comfort as compared to four-ply tires. Do not attempt to economize by buying lighter or smaller tires as replacements, since they may be dangerously overloaded in use, and hence rendered unsafe.

Tire Wear

More tire wear is probably occasioned by under-inflation than by any other factor. It has been estimated that 15 to 30% of the consumer's outlay for tires is wasted by running with under-inflated tires. Maintain proper pressure by having the tires checked regularly, more often in summer than in winter, and very often on a long trip in hot weather. Remember, however, that the pressure recommended for any tire is that which the tire shows when it is at the temperature of the surrounding air. Measurement of pressure should be made, therefore, when the tire is cool—not, for example, after it has been heated by a long run at high speed. Putting the spare into service and retiring one of the other tires to spare duty will lessen the deterioration from which unused tires suffer. Correct wheel alignment, properly adjusted brakes, minimum possible contact with oil or grease, care in starting and stopping, and the avoidance of striking and scraping obstacles all lead to increased tire life. If chains are used in winter, a somewhat loose chain will cause less tire damage than a tight one.

Mail-Order Tires—Price Comparisons

The tires sold by Sears-Roebuck retail stores were not identical with those sold by mail, and were priced about 20% higher. (The 20% difference may run up to 60%, if one does not take advantage of a sale or $3 "allowance" for turning in an old tire.) In general, we assume that it is the mail-order firms' policy not to compete with local dealers so energetically as to arouse their sharp antagonism.

In the case of Sears-Roebuck, both the mail-order so-called first-line tire and the retail-store tire received an *A* rating (the tire sold by the retail store was somewhat better with respect to wear resistance of tread and resistance to ply separation). However, the tires sold through the two outlets were made to different specifications, as shown by a difference in the fabric ply arrangement around the bead wires. Considering Sears-Roebuck's tires, it will be seen that the two types of *Allstate* are priced at $7.75 and $9.45, while "first-line" tires of nationally advertised brands in the *A* and *B* groups were priced at $14.05. On another tire, the *Allstate President*, the catalog price was $10.45, whereas the price quoted by several Sears-Roebuck retail stores was $14.45 ($17.45 if no trade-in tire was offered in exchange at the time of purchase).

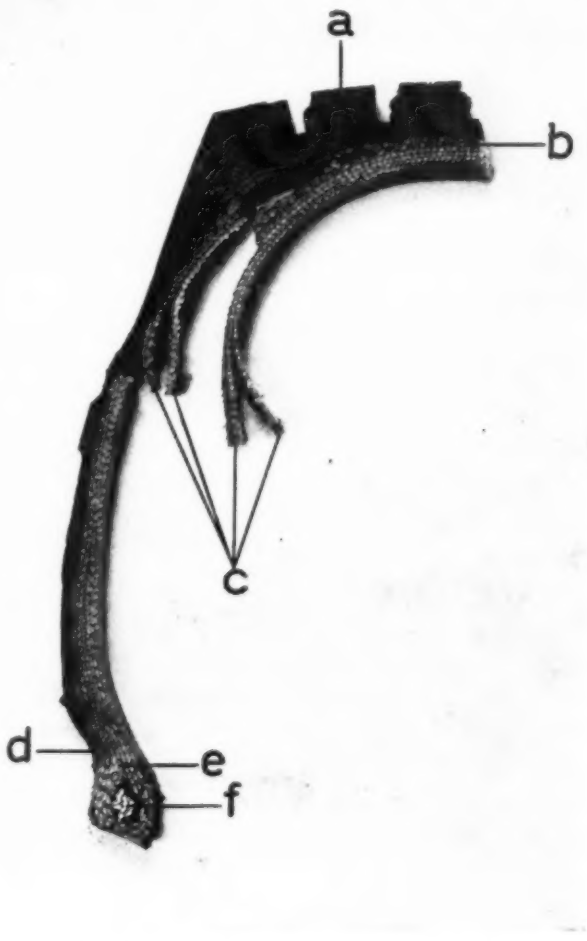


Fig. 1—One-half of a cross-section of a tire: (a) tread, (b) cushion with 2 breakers, (c) 4 plies, (d) chafer, (e) flipper, (f) wire bead.

Readers may recall that in the March 1938 and March 1939 *Bulletins* we reported that at the lower mail-order prices it charged for tires, Sears had been able to maintain a gross profit margin of 40% in the sale of tires made by Goodyear; this perhaps tells all one needs to know of the waste and excess costs in the distribution methods of the tire manufacturers whose sales of trade-brand tires are through a great many small dealers. The margin of saving to the consumer, reported in the March 1938 *Bulletin*, through purchase of Sears' mail-order tires as against regular well-known brands through retail tire dealers, was 20% to 35% (neglecting charges for postage); this great saving is now still further increased, the difference this year being about 45% in favor of Sears-Roebuck. At the present time prices at Sears-Roebuck *retail* stores are more favorable to consumers, by comparison with prices of nationally known brands, than they were in 1938, the difference being about 32% (as against 7½% to 10% in 1939).

It may be noted that some years ago, the government made very large tire purchases from Sears-Roebuck when fourteen of the regular tire companies submitted identical bids, in carrying out, as to government purchases, the spirit of the Robinson-Patman Act passed by Congress to assure manufacturers the right to establish non-competitive prices to consumers on trade-marked articles.

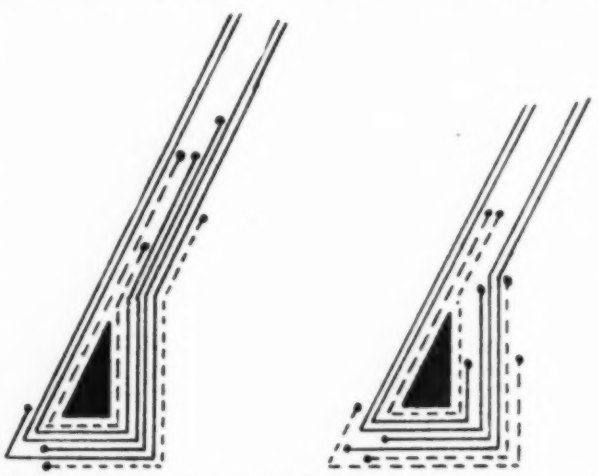
Consumers interested in the problem of gyrations of tire prices—which we admit we cannot express in systematic form in the space available to us here—would do well to review the detailed discussion in the *Bulletins* cited as references in an earlier paragraph.

CR's Tests

In the present test, tires were selected from those five manufacturers whose products are believed to have the widest sales, and from the two large mail-order houses. In the case of Sears-Roebuck, one of the tires sold by the retail stores was also included. NOTE: Montgomery Ward's retail store tires were not included in the tests, as CR's previous tests had shown them to be identical with their mail-order tires. All tires were purchased at retail in a midwestern city, were four ply, size 6.00 x 16, and, with two exceptions (the *General Silent Grip* and *Ward's Riverside De Luxe*), were *so-called* first-line tires. The *Goodrich Silvertown Ameripol*, although selling at a premium price, was comparable in construction with other "first-line" tires. Each of the tires selected for test was weighed, measured, and then carefully dissected. Each part was examined for quality of workmanship, design, and quality of materials. Resistance of the tread to abrasion (a measure of the wear-resisting qualities of the tire in use) was determined on an abrasion-test machine. Breaking strength, hardness, and stress-strain (unit-elongation plotted against unit-load) data, obtained by means of a tensile-strength machine, together with tread dimensions, gave added points with which

to judge the quality of the tread and its probable relative life in use. The important factor of running temperature, with its great effect on tire life, can be judged by a rubber technologist upon the basis of a careful study of tread and carcass dimensions and relationships of parts. The tires in the present test were judged thus with regard to probable relative running temperature. The forces necessary to separate the plies or layers were also measured. Four such adhesion measurements were made, i.e., between sidewall and carcass, cushion and carcass, second and third plies, and outer breakers and tread. The number of cords per inch, their make-up, breaking strength, and position in the carcass were determined, as were the thread count, width, thickness, and weight of the flippers and chafers (see Fig. 1). A number of other determinations, all important in judging the strength and durability of the tires, were made. In rating each tire, greatest weight was given to its probable wearing qualities, with the qualities of the carcass receiving the next greatest weight. (The carcass, i.e., fabric and rubber parts, exclusive of the tread rubber, is chiefly responsible for the safety of the tire.) Construction, design, and quality of the beads and breakers were also carefully considered.

It should be pointed out that variations in tire manufacturing may easily produce a lot or a run, of perhaps several hundred tires, whose qualities may vary widely from the general average of production. It is, therefore, possible for consumers to purchase particular tires whose characteristics may differ widely from the samples tested by CR. But we believe that the following ratings should be a reliable guide, in the great majority of cases, to the brands and lines of tires tested.



Diagrams showing typical arrangements of 4 cord plies and fabric around beads.

Ratings are cr41.

A. Recommended

Allstate Rib-Tread, No. 3466 (Sears-Roebuck retail stores) $9.45 sale price; regular list price advertised as $12.35. Similar to *Allstate Companion*, but tread resisted wear somewhat better, and resistance to ply separation was best of the tires tested.

Allstate Companion, Sears-Roebuck's No. 95—0400. $7.75 plus shipping charges. Satisfactory tread wear (though wear resistance was somewhat lower than other tires rated *A*); very good carcass (referring to cord properties, resistance to ply separation, resistance to bruising). Cord characteristics judged best of the tires tested.

Firestone Champion (The Firestone Tire & Rubber Co., Akron, Ohio) $14.05. Good tread wear. Had good carcass, containing cord of very good characteristics. Judged relatively favorable in respect to operation without overheating.

General Silent Grip (General Tire & Rubber Co., Akron, Ohio) $16.25. Tread wear, very good. Second highest in resistance to ply separation. Carcass good, but judged somewhat susceptible to bruising. Tire was judged relatively favorable in respect to operation without overheating. Had no breaker strips (judged not to be a disadvantage).

Riverside De Luxe, Montgomery Ward's No. P564—364. $8.95 plus shipping charges. Generally well made and well above average in all important respects. Judged best of tires tested in respect to tread-wear resistance.

U.S. Royal De Luxe, Brake Action Tread (U.S. Rubber Products, Inc., N.Y.C.) $14.05. Nearly equal in most properties to Montgomery Ward's *Riverside*, except that properties of the cord were less good, and the tire had much lower resistance to ply separation.

B. Intermediate

Goodrich Silvertown Ribbed Tread R-8 (B. F. Goodrich Co., Akron, Ohio) $14.05. Judged to give somewhat poorer tread wear than other natural rubber tires tested. Carcass characteristics, relatively low.

Goodyear De Luxe Rib Type Regular (Goodyear Tire & Rubber Co., Inc., Akron, Ohio) $14.05. But for unusually low resistance to ply separation, tire would probably have received an *A* rating.

C. Not Recommended

Goodrich Silvertown Ameripol (B. F. Goodrich Co.) $19.95. Carcass characteristics satisfactory, otherwise properties resembled those of *Goodrich Silvertown*. Tread made of synthetic rubber; it was judged considerably inferior in wearing qualities to the natural rubber tires tested. For unusual operating conditions involving prolonged exposure to oil, this tire should be very useful since synthetic rubber is much more resistant than natural rubber to such exposure. ¶Synthetic rubber is still in the developmental stage of design and production, and it is considered likely that its wear resistance will be increased as more experience is gained with the incorporation of this material in tires. Evidence in CR's files would indicate that the wear resistance of tires made of some types of synthetic rubber may in some cases be actually better than that of tires of natural rubber. If this may be accepted as reliable, the performance of *Ameripol* should perhaps be considered as below the present possibilities of synthetic rubber materials.

Notice: Items for Sale

CR has for sale, at very favorable prices, a few items of radio, phonograph, and photographic equipment (including two stereoscopic cameras and an audio amplifier) which have been used for experimental or test purposes. Full particulars are available on request by any interested subscriber. Send a self-addressed, 3-cent-stamped envelope.

Scouring Powders

THE PRINCIPAL harm in using inferior scouring powders is the damage they do to enamelware, glass, and other smooth surfaces. Harsh scouring powders scratch these fine surfaces so that they dirty more easily and become more and more difficult to clean to a spick-and-span appearance. The damage once done can never be repaired; there is no way to bring back to abrased porcelainware and enamelware their original bright new appearance.

The most *important* characteristic of any scouring powder is that it shall produce the least possible amount of scratching; the necessary cleaning effectiveness must be secondary to that. Unfortunately, especially fast-working cleaning powders generally contain abrasives that are too harsh for use on any fine ware or surface. Anybody can make a scouring powder that works fast and cleans thoroughly, but *don't* let any demonstrator or advertiser take your mind off the safety of the powder for surfaces that you want to look well—not just now, but three years from now!

Nine brands of scouring powders tested by CR. Different brands showed great differences in the amount of scratching they produced under the same conditions of rubbing on a glass test surface.

Another factor to consider when buying a scouring powder is its cost. The cheapest powders tested by Consumers' Research cost only 1/5 as much per ounce as the most expensive ones; yet some of the cheapest powders were more desirable for consumers' use than was one of the expensive ones.

Nine brands of scouring powder in CR's test were examined by a scientist skilled in the identification and properties of rocks to identify the principal powdered-rock ingredients. The petrographer then carefully tested each powder to determine the extent to which it would scratch glass in a wear-test machine that turned a weighted spindle, bearing on the glass. On the end of the spindle there was attached a wet cloth to which the powder was applied. Ratings are based primarily on the results of this test—the most desirable powders being those which produced the least scratching.

The housewife perhaps should be reminded that these cleansers have been and commonly are recommended for a host of duties for which they should never be used, such as cleaning jewelry, nickel and chromium plate, silverware—not to speak of brand-new enamel or stainless steel cooking ware. Possibilities for harm are likely to be underestimated because the harm done usually develops rather slowly, and hence may go unnoticed till it is too late to save the surface finish. Ratings **are cr41.**

A. Recommended

Mixture of whiting (paint stores) and tetrasodium pyrophosphate (for sources of supply, see *Water Softeners* in CR's 1940 *ACB*) in proportion of about 9 of whiting to 1 of tspp. (exact proportion does not matter). About 2.8 oz per cent. Recommended for all new surfaces, and serves the purpose of safe and proper cleaning of all surfaces not seriously dulled by prior use of scouring powders. **1**

Bluebrook (Distrib. Jewel Food Stores, Chicago) Three 14-oz cans for 10c (4.2 oz per cent). Mostly quartz and dolomite in proportion of 5 to 4, respectively, plus a water-softening chemical. Second best of 9 brands in the amount of scratching produced. ¶Note that this cleaner provided 3 or 4 times as much scouring material per cent as did *Bon Ami* and *Powow*, in this group, or the *C*-rated *Bab-O*. **1**

Lighthouse Cleanser (Armour & Co., Chicago) Four 14-oz cans for 19c (2.9 oz per cent). Mostly pumice. Amount of scratching, less (more favorable) than average. **1**

Sunbrite Cleanser (Swift & Co., Chicago) Two 13-oz cans for 10c (2.6 oz per cent). Mostly pumice and quartz, in proportion of 3 to 2, approximately. Slightly short of claimed weight. Amount of scratching, less than average. **1**

Old Dutch Cleanser (Cudahy Soap Works, Chicago) Two 14-oz cans for 15c (1.9 oz per cent). Mostly pumice. Amount of scratching, less than average. **2**

Bon Ami Powder (The Bon Ami Co., N.Y.C.) Two 12-oz cans for 28c (0.9 oz per cent). Mostly orthoclase and albite in proportion of 2 to 1, respectively, and soap. Amount of scratching, least of the 9 brands tested. **3**

Powow (West Coast Soap Co., Oakland, Calif.) 9-oz can for 10c (0.9 oz per cent). Mostly pumice. Third best as to scratching effect in test. Slightly short weight. **3**

C. Not Recommended

Fairbank's Gold Dust (Hecker Products Corp., Soap Div., N.Y.C.) Two 14-oz cans for 10c (2.8 oz per cent). Mostly quartz. Amount of scratching, worse than average. **1**

Kitchen Klenzer (Fitzpatrick Bros., Inc., Chicago) 13-oz can for 5c (2.6 oz per cent). Mostly pumice and quartz in the proportion of 2 to 1, respectively. Amount of scratching, somewhat worse than average. **1**

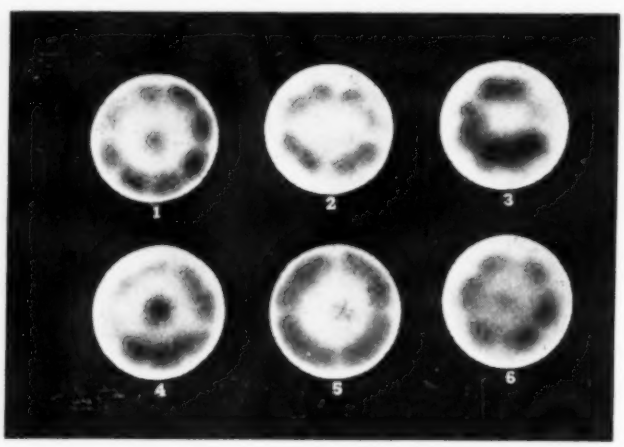
Bab-O (B. T. Babbitt, Inc., N.Y.C.) Two 14-oz cans for 22c (1.3 oz per cent). Mostly quartz. Amount of scratching, most objectionable of the 9 brands tested. Slightly short weight. **3**

Gas Ranges

WE ARE pleased to announce that our latest test indicates a definite improvement in the performance of gas ranges over that reported two years ago. The best ranges in the present test did not give better performance than did the best ones in the preceding test, but the poorest were definitely better than the poorest of the earlier study. Ranges in the preceding test that were found to be the least efficient had such faulty burner design that they would cost $6 to $10 a year more to operate in the average home than the most efficient ones. On the other hand, ranges in the present test which had the least efficient burners wasted only half as much gas as did the inferior ranges in the earlier test, so that now the difference between the best and the poorest ranges amounts to about $3 to $5 a year at average gas rates. Even this amount of waste in operating expense, however, is one that most buyers will wish to avoid by purchasing a range that has been found by tests to be relatively efficient.

When selecting a gas range, the purchaser should try to obtain top burners having an efficiency of 40% or more. This efficiency is now required of a range that is to receive the approval of the American Gas Association laboratories at Cleveland. An efficiency of 45% is required for a Certified Performance (C.P.) range, and efficiencies somewhat higher than this are now not uncommon. The higher the efficiency, of course, the less one has to pay each month for gas. Ovens should require no more than 3800 Btu per hour per cubic foot of oven space to maintain an oven temperature of 500°F in a room at 80°F. It is unnecessary, however, to buy one of the relatively high-priced C.P. ranges in order to obtain efficient performance, for manufacturers often supply the same range in two models which have the same efficiency but only one of which is made to comply with all C.P. requirements. (C.P. requirements, which were listed in CR's January 1939 *Bulletin*, are concerned not only with efficiency but also with convenience features, such as automatic oven lighting, broiler lighting, etc. A few changes, believed to be minor, have been made in the specifications since that time.)

Generally speaking, an oven should be at least 14 inches high, 16 inches wide, and 19 inches deep. If the racks are properly adjusted, this size of oven is large enough to permit baking six one-pound loaves of bread at one time, or roasting a medium-sized turkey. An oven door which is hinged at the bottom and drops down to form a shelf is usually preferable to one hinged at the side. For cooking requiring rapid heating—pan-frying a steak, for example—it is advantageous to have one giant-sized burner. Burners with an inner cone that is removable for cleaning are a desirable type. Buy no range that lacks the approval symbol of the American Gas Association (A.G.A.), for this symbol gives some assurance that the range meets important *basic requirements of safe design* and complies with *minimum standards of performance.*

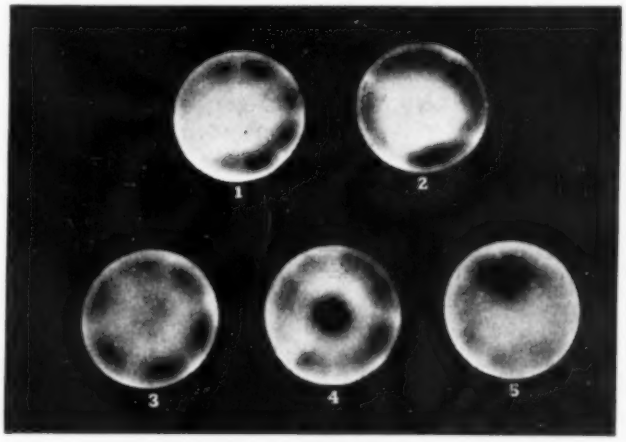


Scorch patterns produced by regular-sized burners of gas stoves tested by CR. Evenness of discoloration is an indication of evenness of heat distribution of the burner.
(*1*) Tappan *W-43*, (*2*) Magic Chef *7201-14*, (*3*) Commander, *Montgomery Ward's 168—6503*, (*4*) *Sears-Roebuck's 28730*, (*5*) Estate *1703*, (*6*) Glenwood *225*.

CR's tests were made to determine efficiency of the top burners in heating to the boiling point a standard volume of water in a standard utensil, evenness of their heat distribution, whether they were easily extinguished by substances (e.g., soap solution or a cereal) boiling over, and whether they were quickly lit by the pilot light. The ovens were tested for rate of heating and rate of heat loss to the room—important for its effect upon operating cost, and also affecting room temperature (a matter of importance in hot weather).

Time required to preheat the oven and the gas consumed in preheating were measured. Oven thermostats were tested for accuracy at temperatures of 250°F, 400°F, and 500°F. Evenness of heat distribution was determined in both the oven and broiler by baking cookies and toasting bread, respectively. To permit judgment of the carbon monoxide hazard, gases of combustion were collected, and determinations of oxygen, carbon dioxide, and carbon monoxide were made on one regular-sized and one giant-sized surface burner and on the oven and broiler burners, to determine whether the burners complied with basic requirements for safety.

Efficiency of the extra-large or so-called giant-sized top burners varied on the different ranges from 39% to 45%, that of the regular-sized burners, from 40% to 48%. The least efficient oven consumed approximately ¼ more gas per cubic foot of oven space than did the most efficient oven, thus making its cost of operation run to perhaps $1 or $2 more a year, in the average household. Time to preheat the oven from a temperature of 80°F to 400°F varied from 8 minutes to 9¾ minutes—the difference presumably being of little significance to most users. Evenness of heating by the surface burners was judged to be important for successful cooking, since to cook evenly, all parts of a skillet should be as nearly as practicable at the same temperature. Likewise, evenness of temperature distribution is desirable in ovens and broilers. Evenness of heat distribution was found to vary considerably for the different ranges.



Scorch patterns produced by giant-sized burners. Note that heat distribution is not as uniform as with the regular-sized burners.
(*1*) Magic Chef *7201-14*, (*2*) Estate *1703*, (*3*) Glenwood *225*, (*4*) *Sears-Roebuck's 28730*, (*5*) Commander, *Montgomery Ward's 168—6503.*

To be fully satisfactory, thermostats should be accurate at the various settings to within 10°F—a reasonable requirement. Thermostats of four ranges failed to meet this requirement. All burners tested, with one exception, met A.G.A. requirements limiting maximum amount of carbon monoxide during burning. The automatic lighters on all the ranges performed satisfactorily for 25 consecutive operations.

All the top burners of the *Glenwood*, *Magic Chef*, and *Estate* ranges were equipped with burners having "high-low" valves, which allow the housewife to turn the flame quickly to its lowest setting. Montgomery Ward's and Sears-Roebuck's ranges each had one burner of this type. The *Tappan* range had none. Low-flame settings maintain slow boiling over long cooking periods, at low gas consumption. In the ranges tested by CR, however, the burners in general consumed a needlessly large amount of gas on the low setting, and hence were not entirely satisfactory. Burners which lacked the high-low valves could be turned lower so as to burn less gas than was consumed by the burners with special valves. On low settings, the burners with high-low valves consumed gas about 1/8 to 1/5 as rapidly as on high settings. It should be noted that the above is only a brief résumé of a great deal of testing and study of these ranges, but it is believed that the points most essential for the layman to have knowledge of in purchasing a gas range will be found in the foregoing and in the listings which follow.

All ranges in the test were lent by their manufacturers or distributors for the duration of the test and were selected at random from regular stock. All carried the A.G.A. approval insignia. Ratings are cr41.

A. Recommended

Glenwood, Model 225 (Glenwood Range Co., Taunton, Mass.) $91.67. Oven dimensions: height, 13¾ in.; width, 16 in.; depth, 19¼ in. Burner efficiency: regular burner, 48% (highest efficiency of the burners on any of the stoves tested); giant burner, 42%. Evenness of heat distribution: regular burner and giant burner, very good; in oven, satisfactory; in broiler, poorer than average. Performance in test to determine susceptibility of burner being put out by boiling over of liquid, poor. Somewhat below average in respect to rate of heat loss from oven. Oven thermostat gave a temperature somewhat too low when set at 500°F. General construction, judged good. **3**

Magic Chef, Model 7201-14 (American Stove Co., Cleveland) $134.50. Oven dimensions: height, 14 in.; width, 16 in.; depth, 19½ in. Inner cone of burners removable for cleaning (desirable). Burner efficiency: regular

burner, 43%; giant burner, 40%. Evenness of heat distribution: regular burner, good; giant burner, fair; in oven, satisfactory; in broiler, good. Performance in boil-over test, fairly good. Better performance than average in respect to rate of heat loss from oven. In general construction and mechanical details, this stove was judged best of those tested. **3**

B. Intermediate

Commander, Montgomery Ward's No. 168– 6503. $64.95 plus freight. Oven dimensions: height, 14 in.; width, 18 in.; depth, 19 in. Burner efficiency: regular burner, 40%; giant burner, 39% (lowest of the ranges tested). Evenness of heat distribution: regular burner, fair; giant burner, poor; in oven, satisfactory; in broiler, good. Performance in boil-over test, fair. Rate of heat loss from oven, better (less) than average. General construction, judged fair. **2**

Sears-Roebuck's No. 28730. $74.95 at retail stores. Oven dimensions: height, 16 in.; width, 18 in.; depth, 19½ in. Inner cone of burners removable for cleaning (desirable). Burner efficiency: regular burner, 47%; giant burner, 45% (good). Evenness of heat distribution: regular burner, fair; giant burner, rather poor; in lower half of oven, not satisfactory; in broiler, fair. Performance in boil-over test: regular burner, poor; giant burner, fair. Rate of heat loss from oven, about average. Oven thermostat gave temperatures somewhat too high when set at 400°F and 500°F. General construction, judged fair. **2**

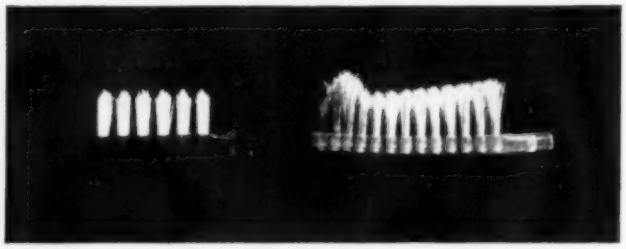
Tappan, Model W-43 (The Tappan Stove Co., Mansfield, Ohio) $64.95. Oven dimensions: height, 13 in.; width, 16 in.; depth, 19 in. Burner efficiency: regular burner, 45% (good); had no giant burner. Evenness of heat distribution: regular burner, good; at bottom of oven, not satisfactory; in broiler, very good. Performance in boil-over test, poor. Rate of heat loss from oven, poorer (greater) than average. Thermostat gave a temperature somewhat too high when set at 250°F. General construction, judged good. **2**

Estate, Model 1703 (The Estate Stove Co., Hamilton, Ohio) $124.95. Oven dimensions: height, 14¼ in.; width, 17 in.; depth, 19¼ in. Burner efficiency: regular and giant burners, 43%. Evenness of heat distribution: regular burner, good; giant burner, fair; at bottom of oven, not satisfactory; in broiler, fair. Performance in boil-over test: regular burner, good; giant burner, poor. Rate of heat loss from oven, average. General construction, judged good. Giant burner failed by an appreciable margin to meet standard requirements limiting maximum production of carbon monoxide. The *Bar-B-Kewer* broiler gave excellent results when tested with rib roast and chicken, but instructions furnished with range for obtaining minimum flame setting were considered inadequate. Oven thermostat gave a temperature somewhat too high when set at 250°F. **3**

Toothbrushes

TODAY's big news in toothbrushes is, of course, synthetic bristles. Led by Weco Products with *Dr. West's "25"* and *Dr. West's Miracle Tuft*, priced at 25c and 47c respectively, the larger toothbrush companies, one by one, are bringing out brushes with synthetic bristles.

All the brushes with this type of bristle which were on the market in time were included in this study, along with the many well-known brands that are still equipped with natural bristles. Results of the tests indicate that there can be no question at all as to Nature's having been surpassed by the synthetic bristles,[1] which show superior serviceability over natural bristles in all the most essential respects, i.e., they resist wearing down much better, they don't "bush" or spread at the wearing surface, and they are much less likely to come out of the base in which they are held. Eventually, it would seem, American toothbrush makers will no longer need to import hog bristles, but will depend entirely upon synthetic bristles of domestic manufacture.



(*a*) (*b*)

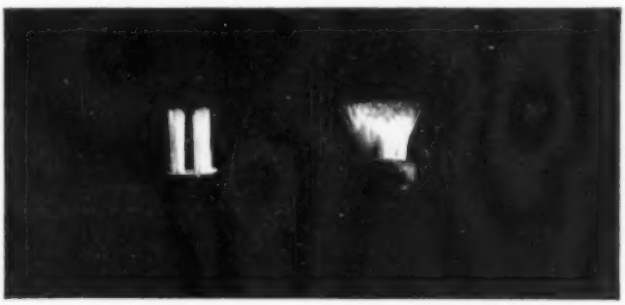
Fig. 1—(a) The approved shape of toothbrush. (b) The non-approved type of brush with 4 outstanding faults: bristles too long; tufts too closely set; tufts uneven in height; and special tufting arrangement at one end.

According to their respective advertising, Exton bristles are used in *Dr. West's Miracle Tuft* brushes; Nylon, in *Dr. West's "25"* and in the *Tek* and *Prophy-lac-tic* brushes using synthetic bristles; Fibrex, in *Pepsodent Fifty Tuft*. Whatever the name, the materials from which the bristles are made are quite similar and gave similar performance in the test, though they are possibly not identical chemically. The chief difference between the various brands was in the size of the bristles, Exton bristles being the coarsest of the three while Fibrex and Nylon were much the same size. While most synthetic bristles retain their stiffness even when wet, those of the *Pepsodent Fifty Tuft* brush became quite soft when thoroughly moistened. This may be a normal result of the smaller size of the separate tufts, or it may be due to a difference in actual properties of the synthetic material.

In buying brushes for test, those of the approved professional shape, shown in Fig. 1, (a), were chosen wherever possible; seemingly, this year there were

[1] CR makes one reservation about the new types of bristles used in toothbrushes. We cannot be sure, nor do we believe anyone else can say positively at this time, that the new synthetic bristles will compare favorably with the older, natural bristles in respect to freedom from the probability of harm being done internally by bristles that may be accidentally swallowed.

substantially fewer unsuitably shaped brushes offered for sale than formerly. *Dr. West's* brushes of the "Professional" shape and *Tek* brushes deviated somewhat, but not seriously, from the approved shape. *Dr. West's* brushes of the "Regular" shape were judged unsuitable, as also *Pro-phy-lac-tic* and *Dentatuft*, which still retained their long-tuft form, characterized by a group of long tufts at one end; hence, these three fall into the *C. Not Recommended* division (see CR *Bul.* Oct. '38).



(*c*) (*d*)

Fig. 2—End view of two toothbrushes after the wear test, showing (c) a brush that resisted wear satisfactorily, and (d) a specimen with the bristles badly "bushed" or spread.

Much has been written on proper methods of cleaning the teeth, authorities differing rather radically from one another on the methods that dentists should teach their patients. For the present, we must be excused from attempting to offer definite advice on this matter and refer the reader to his dentist, knowing full well that the advice he obtains will depend largely upon which dentist he consults. Suffice it to say, however, that one type of tooth-cleaning method which is in very common use—perhaps the most common of all—is definitely bad and ruinous to the teeth, namely, horizontal sawing of the brush across the faces of the teeth. There is much evidence that this treatment of the teeth and gums has resulted in serious erosion of the teeth at the gum line.

In addition to the regular method of testing toothbrushes previously described in CR's *Bulletin* (May 1936), the brushes were subjected to a new test involving hard rubbing under high frictional drag, against the slightly tacky surface of a corrugated or ribbed rubber mat; the number of bristles lost was carefully noted. This method dislodged some bristles which didn't come out of their sockets during the mechanical test in which the bristles were rubbed in a motor-driven appliance against the glossy, metallic, corrugated surface used in the primary wearing or durability test.

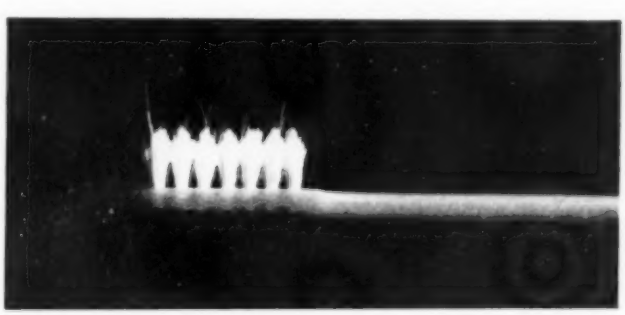


Fig. 3—An unsatisfactory brush whose bristles are not firmly secured but keep coming out—one of the consumer's pet aversions.

The brushes rated *A* which precede the asterisks gave performances in the tests that were far superior to those in the rest of the *A* group. Inasmuch as synthetic bristles may not yet be widely enough marketed to be available to our subscribers everywhere, it was thought wise to list in that second group, recommended with qualifications, for the present, those brushes with natural bristles which gave relatively satisfactory results, results which would have earned an unqualified *A* rating before the days of synthetic bristles. Ratings are cr41.

A. Recommended

The following brushes were of approved shape except as noted; bristles were synthetic and firmly attached; no bushing or spreading of the bristles at their free ends was evident at end of test.

Dr. West's "25" Oro (Weco Products Co., Chicago) 23c. **AA2**

¶*Dr. West's "25"* Professional, 23c. Not included in the wear test but would appear to warrant an *AA* rating except for its deviation from the most approved shape.

Dr. West's Miracle Tuft 2 Row Oro (Weco Products Co.) 47c. Had heavier handle and stiffer, larger-diameter bristles than *Dr. West's "25."* **AA3**

Tek Nylon (Johnson & Johnson, New Brunswick, N.J.) 25c. Would have warranted an *AA* rating except for its deviation from the most approved shape. **2**

Dr. West's Miracle Tuft 2 Row Professional (Weco Products Co.) 47c. Had heavier handle and larger bristles than *Dr. West's "25."* Would have warranted an *AA* rating except for its deviation from the most approved shape. **3**

Pepsodent Fifty Tuft (Pepsodent Co., Chicago) 47c. Synthetic bristles of this brand seem to be of somewhat different quality from *Dr. West's* (see text). **3**

* * *

The following brushes were of the recommended shape, but had natural bristles which showed some degree of bushing or spreading and/or were not as securely fixed in place as the synthetic bristles in the preceding group.

Montgomery Ward's No. 53—3940. 19c. **1**

Masso Dental Type (Prophy-lac-tic Brush Co., Florence, Mass.) 25c. **2**

Montgomery Ward's No. 53—3967. 29c. **2**

D. D. Double Duty (Bristol-Myers Co., N.Y.C.) 50c. Had twisted handle. **3**

Pycopé (Pycopé Inc., Jersey City, N.J.) 50c. **3**

C. Not Recommended

Except as noted, brushes in this group had natural bristles which bushed badly, some or many of which came out during the test.

Dentatuft, 92-10. 10c. Very unsuitable in shape. **1**

Superior, Montgomery Ward's No. 53—4137. 9c. Ends of bristles broke. **1**

Reputation Professional, Sears-Roebuck's No. 8—5011. 18c plus postage. **1**
Takamine Certified (Takamine Corp., 132 Front St., N.Y.C.) 2 for 29c. Handle, enameled (undesirable). **1**
Takamine Scientific (Takamine Corp.) 10c. Bushing did not occur. **1**
Approved, Sears-Roebuck's No. 8—5004. 26c plus postage. **2**
Dr. West's 2 Row Professional Waterproofed (Weco Products Co.) 25c. Adult's. **2**
Dr. West's Economy (Weco Products Co.) 25c. Adult's; unsuitable in shape. **2**
Dr. West's "25" Regular, A Nylon Product (Weco Products Co.) 23c. Unsuitable in shape. Not included in the wear test. **2**
Masso, 2 Row (Pro-phy-lac-tic Brush Co.) 33c. Bushing did not occur. **2**
Pepsodent Professional (Pepsodent Co.) 20c. **2**
Pro-phy-lac-tic Nylon (Pro-phy-lac-tic Brush Co.) 23c. Very unsuitable in shape. Not included in the wear test. **2**
Tefra Refillable (The Tefra Co., Indianapolis) 25c complete; refills 15c each. **2**
Tek (Johnson & Johnson) 23c. **2**
Klenzo De Luxe. 39c. **3**
Squibb Angle (E. R. Squibb & Sons, N.Y.C.) 45c. **3**

Safety in the Chemical Laboratory

PROFESSOR J. W. Greene, of the Department of Chemical Engineering at Kansas State College, read a paper at the University of California, in June 1940, to a meeting of the Chemical Engineering Division of the Society for the Promotion of Engineering Education, discussing safety as it affects instruction in college chemistry and chemical engineering. This interesting paper should be read by all teachers who have the responsibility for the safe conduct of courses in any subjects involving the use of chemical, metallurgical, and other laboratory materials, supplies, shop tools, and equipment.

Recently there have been a number of students seriously injured in the course of laboratory experiments—frequently under circumstances where it seemed that little could have been done to anticipate or prevent the occurrence. However, knowledge of certain important factors in laboratory equipment and practice which have played a part in causing accidents will help to avoid many of them. Some of these points discussed by Professor Greene should become part of the knowledge of every laboratory teacher.

Among the sometimes unsuspected causes of accidents or catastrophes which Professor Greene mentions are the static charges which develop by the flow of materials through pipes or into containers (one persistent individual had three fires during one filling of a wood-jacketed gasoline can). The charge generated by a person walking across a heavy carpet may cause a spark of sufficient intensity and heat to ignite a natural gas mixture with an ignition point of 1200°F. Motors with exposed brushes and those with the usual starting winding switches introduce obvious hazards in the presence of flammable vapors.

Students frequently exhibit the most careless disregard for toxic materials, ignoring the exceedingly small concentrations of some materials such as hydrogen cyanide and nitric acid fumes which can cause death.[1] Professor Greene mentions the extreme danger of inhaling even minute amounts of mercury vapor and the correspondingly great hazard of mercury in open containers. He performs a valuable service in calling attention to what few chemists have recognized until lately, namely, the high toxicity of carbon tetrachloride and of many other organic halides and benzene [benzol], and the especially deadly compounds, aniline and nitrobenzene.

One case is cited involving a thief who was killed when he lighted a match in a room that was used to store alcohol and ether. He thus became the unknowing demonstrator of an improper technique that had been followed in the storage of these flammable liquids.

The author of this 11-page mimeographed paper has very kindly offered to make copies of it available to all who may wish it, at 10c the copy. Address Professor J. W. Greene directly, at Kansas State College, Department of Chemical Engineering, Manhattan, Kansas.

[1] For the hazard of cyanide fumes occasionally produced in connection with photographic solutions, see "The Amateur's Darkroom," in *Consumers' Digest*, August 1939, pp. 30-34 (15c from Consumers' Research.

CUMULATIVE INDEX
General Bulletin, Volume 10: October 1940 to June 1941, Inclusive

This index is for the issues of October 1940, Vol. 10, No. 1; January 1941, Vol. 10, No. 2; April 1941, Vol. 10, No. 3; and June 1941, Vol. 10, No. 4. Single *Bulletins* are 30 cents each and are not confidential.

Entries starred are brief or minor items.

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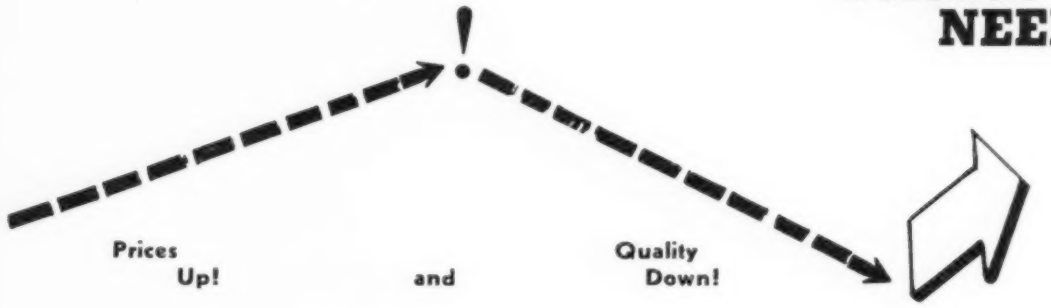
When THIS *happens....*

You and Your Friends NEED



PRICES are up and going higher on many of the things you buy. That's no news to you. Furthermore, it is obvious to those who watch the papers or hear the news on the radio that a very large part of the American system of farm and factory production will very soon be closely geared to national defense and centered upon its requirements rather than the wants of consumers. Munitions and war materials and every sort of goods and supplies needed by the Army and Navy personnel will surely have the right of way. There will inevitably be large and often vitally important dislocations in the consumers' goods market.

History of Consumers' Research

In 1927 appeared YOUR MONEY'S WORTH, a "study in the waste of the consumer's dollar," by Stuart Chase and F. J. Schlink. After devoting a half year of weekends, holidays, and spare time to answering the questions of readers of the book who wanted advice to guide them in their purchases, one of the authors decided that a local consumer's club which he had previously organized should be expanded to meet the problems of such correspondence and to obtain more data on goods.

During its first year, the enlarged Consumers' Club acquired a membership of 565 persons. In December, 1929, the Consumer's Club became Consumers' Research, Inc., designed to do on a larger scale the work formerly undertaken by the experimental volunteer organization. It has grown steadily until, at the present time, there are over 60,000 subscribers.

Consumers' Research has a staff of about fifty persons which collects, compiles, and interprets information for its consumer subscribers. This staff is aided by a large number of additional technical and scientific consultants and advisers selected with the greatest care for their competence, disinterestedness, and independence of commercial bias.

Products to be tested are purchased on the open market just as you would buy them. Then they are studied, analyzed, tested, and examined for the factors important to the consumer. Many of the testing devices had to be developed by CR's own experts in its laboratories.

TAKE THE GUESSWORK OUT OF YOUR BUYING

In view of current trends, it is more important than ever that the family purchasing agent have at his fingertips, information that will enable him to appraise the merchandise he is planning to buy. He needs to know how to distinguish superficial advantages from real ones, to know what qualities of goods are essential and which are to build up talking points and advertising copy.

Particularly, you need reliable information if you are considering stocking up for regular family needs of clothing, household supplies, and canned goods. There is more risk in buying in quantity and more need for skill and knowledge in purchasing, so that, in case the situation changes, there will be no undue loss. Helping people to choose wisely among the many brands of goods, supplies, and appliances on the market continues to be the basic function performed by Consumers' Research, whose advice to consumers is more than ever indispensable as a guide to wise buying.

If you (or your friends) like to pick a refrigerator that will cost only two-thirds as much for electricity to run it as another and will run for years with a minimum of deterioration, or the low-priced vacuum cleaner that picks up the most dirt compared to the other six or eight leading brands on the market, then read on. Filling out the application blank below and returning it to us with a remittance of $3 will bring returns on the investment seldom encountered these days.

THESE SUBSCRIPTION BLANKS

For New Subscribers

Consumers' Research, Inc. Washington, N. J.

☐ I enclose $3 (Canada and foreign $3.50) for one year's subscription to Consumers' Research *Bulletin*. I understand this will include the 1940 *Annual Cumulative Bulletin* as well as all *Bulletins* issued during the coming year (none in July and August), including the 1941 *Annual Cumulative Bulletin*.

It is understood that my handling of any CR material which is marked "The analyses of commodities, products, or merchandise appearing in this issue of the CR Bulletin are for the sole information of subscribers" will be in accordance with that direction.

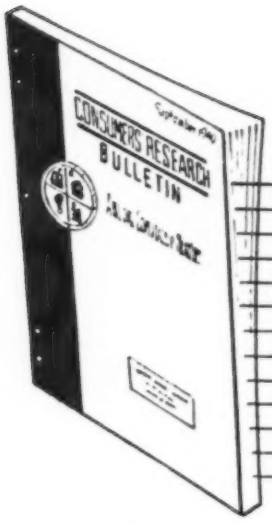
Name.....
(Please write in longhand)

Street.....

City.....State.....

My profession or business is.....

CR-6-41



The Consumer's Handbook of Buying . . .

- Medicine and Hygiene
- Radio Sets and Musical Instruments
- Household Supplies and Methods
- Cosmetics and Toilet Supplies
- Foods
- Textiles and Clothing
- Furniture and Furnishings
- Instruments Used in the Household
- Automobiles, Parts, Accessories, Supplies
- Paint, Enamel, Varnish
- Lamps and Lighting
- Cameras, Photographic Supplies
- Household Appliances and Equipment

This Annual Cumulative Bulletin May Help You Save $100 Yearly

The *Annual Cumulative Bulletin*, alone, contains ratings of more than 4,000 products. It is a well-printed book of 240 pages, set two columns to the page, and measures 7¾ x 10⅝—dimensions only slightly smaller than a telephone book for a city of half a million population. Revised for issuance in each September, it provides a handy compilation of previous findings, fully indexed for ready reference. It is divided into sections according to the type of products discussed so that all related items appear together. Many sections are preceded by brief, pointed digests of basic information on how to buy and what to look for when buying—information of a definite practical nature.

At the present time, a copy of the 1940 edition is included in all new subscriptions *without extra charge*. As soon as the new 1941 edition is ready on or about September 15, 1941, it will, of course, be sent to all subscribers, too. In addition, a subscriber to the full service is sent *Bulletins* monthly during the period October through June (no *Bulletins* are issued during July and August), which bring him the results of the latest tests on new models and makes and keep the information in the *Annual Cumulative Bulletin* up to date.

For $3 a year, your friends have an opportunity to get the 1940 *Annual Cumulative Bulletin* (while the supply holds out) and the 1941 *Annual Cumulative Bulletin* when it is issued in September. Tell them to subscribe now to save money.

ARE FOR YOUR FRIENDS.

For New Subscribers

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(Please write in longhand)

Street.....

City.....State.....

My profession or business is.....

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HERE'S WHAT OTHER SUBSCRIBERS SAY

"The service has been very satisfactory. I have tried to influence friends to subscribe, by giving them coupons."

Mrs. Fletcher Martin
Chicago, Ill.

"I can honestly say that I look forward to reading Consumers' Research each month more than any other paper that comes into the house."

Paul G. Kneeland
Sterling, Mass.

"It's a real book of knowledge that every consumer should have and especially, if a person wants to be an intelligent buyer, it is of inestimable value."

Dr. John C. Docter
Racine, Wis.

"Aside from the fact that you rate different products, which in itself is valuable to me, I find the editorials, and other articles of equal benefit. Since subscribing to your service my 'consumer knowledge' has been greatly increased. I now look behind the advertising tinsel to see whether or not there is anything there of value. The wealth of information which your service supplies enables me to make purchases more wisely. Aside from that there is considerable satisfaction in knowing that I am no longer 'easy picking' for the ad-men."

Robert M. Martin
Covington, Ky.

"I have a complete file of CR from Sept. 1935, and would not be without your service should its cost be many times the present modest fee.

"On the purchase of a radio set alone you have not only saved me the useless expenditure of $100 or more, but have given me, a musician, hope of being able to listen to reproduced symphonic music with some degree of satisfaction."

H. Butterworth, Jr.
Brandywine, Md.

"My whole family seem to check into Consumers' Research Bulletin almost daily, and I will admit that I consult it quite frequently. In fact it has saved me a lot of money."

Mr. Ernest Kellerstrass
Kansas City, Mo.

"During the past months, I have benefited greatly from each copy of Consumers' Research Bulletin. Any couple contemplating the purchase of household necessities and equipment, expecting best value and durability possible, appreciates the value of such a publication as yours."

Mr. Albert J. Merkeatz
Fairlawn, N.J.

PREVIOUSLY ISSUED

For the benefit of new subscribers, the contents of CR *Bulletins* issued during the current volume year are briefly listed. Issues which are marked "Not Confidential" may be purchased by those who are not subscribers. All monthly *Bulletins* are 30c the copy.

OCTOBER 1940 (Not Confidential)

"Electric Clocks"—ratings of 9 brands.
"Cooking Fats and Oils"—lard vs. hydrogenated oils; fats as shortenings; their nutritional values.
"Laxatives and Bowel Consciousness—A Clinical Study," by Manfred Kraemer, M.D.
"This Class-Ring Business."
"A Report on Children's Shoes"—requirements of a well-designed shoe; test methods; 13 brands rated.
"Reference Books," An Appraisal, by Professor MacEdward Leach—general buying advice; listings of leading encyclopedias of various types.
"Chalks, Art Colors, and Paints"—new test findings on many brands examined for lead, mercury, or arsenic.

NOVEMBER 1940

"Liquefiers"—ratings of the *Fletcherizer*, the *Waring Blendor*, and the *Liqui-Mixer*.
"Felt Hats for Men"—ratings of 12 hats.
"Three Dimensional (Stereoscopic) Photography," by Herbert C. McKay—an introductory article.
"Encyclopedias"—additional listings.
"Ice Cream Mixes"—general discussion of flavor and quality; ratings of 17 mixes.
"Home Building, IX"—another of the series on home building; deals with windows, putty and glazing, window glass, doors including overhead-type garage doors, fly screens, weather strips, awnings, moldings, terrazzo flooring; a bibliography for home builders.

DECEMBER 1940

"Stereoscopic Cameras and Attachments, II," by Herbert C. McKay—discussion of equipment needed; printing; ratings of double-lens cameras and stereo-taking attachments.
"Razor Blades"—ratings of some 33 *Gillette*-type blades and 17 other type blades.
"Cameras for Color Transparencies"—general discussion of *Dollina II*.
"Automobile Heaters"—advantages and disadvantages of various types; ratings of 6 hot-water heaters of dashboard type, 4 hot-water heaters of under-seat type.
"Scotch and Irish Whiskeys"—ratings of 10 brands.
"Brandies"—ratings of 14 brands.
"Wines"—ratings of 43 brands of various types.
"Suspenders for Men"—ratings of 11 brands.
"Motion Picture Equipment"—ratings of *Revere*, Model 80, Series B, projector; and *Revere*, Model 88, camera.
"Power Tools for the Home Workshop"—many ratings.
"1941 Table-Model Radio Receivers"—ratings of 10 sets.

JANUARY 1941 (Not Confidential)

"Two More Automobile Heaters Tested."
"The New Wool Labels"—general discussion.
"1941 Radio Receivers"—brief summary of sets more fully discussed in the December issue and ratings of 4 additional sets; also listings of radios having similar chassis.
"Three Types of Cooking Utensils"—a pressure cooker, an aluminum saucepan, and a stainless steel saucepan.
"What Price Vitamins"—a general discussion of vitamin needs and best sources of supply together with tables showing relative economy of various vitamin preparations.
"Gasoline Consumption of the Low-Priced Cars"—miles per gallon at 3 nominal speeds of 5 cars.
"New Tests of Washing Machines"—ratings of 4 spin-dry machines and 8 wringer machines.

A CONSUMER'S STUDY OF GASOLINES AND LUBRICATING OILS—SPECIAL BULLETIN 26

Discusses in detail properties of gasolines and oils, gasoline and oil dopes, and the latest authoritative information on the changing of crankcase oil. No ratings by brand name.

(Not Confidential) 17 pages (photolithographed) 25c

FEBRUARY 1941

"Automobiles of 1941"—ratings of 1941 cars and discussion of various parts and accessories.
"Automobile Oils—Winter Grades"—ratings of 37 brands.
"Men's Overcoats"—the results of CR's test of 7 overcoats.
"Radio Receivers—High-Fidelity Console Models"—ratings of 7 models.

MARCH 1941

"Radio-Phonographs with Recording Equipment"—ratings of 4 combination sets and 1 home recording converter unit.
"1941 Console-Model Radio Receivers"—ratings of 4 non-high-fidelity models.
"Stepladders"—ratings of 10 brands.
"Women's Umbrellas"—ratings of 6 brands.
"Low-Priced Phonograph Records," by Walter F. Grueninger.
"Stereoscopic Viewing and Projecting, III," by Herbert C. McKay.
"Flashlight Dry Cells"—ratings of 16 brands.
"Window Shades"—ratings of 15 brands.
"Venetian Blinds"—ratings of 9 brands.
"Women's Sanitary Belts"—ratings of 16 brands.

APRIL 1941 (Not Confidential)

"Furniture, I"—first of a series on how to buy which deals with "case goods," i.e., wooden furniture, not upholstered.
"Paints for the Home"—general advice with some listings.
"Men's Rubbers and Women's Galoshes"—by brand.
"Welfare Economics vs. Consumer Welfare," a review of *Economics for Consumers*, by L. J. Gordon.
"Dictionaries and Children's Anthologies"—listings.
"Selecting a Farm Tractor."
Electric Motors for Home Use"—ratings of 12 brands.

MAY 1941

"Automobile Batteries"—ratings of 11 brands.
"Electric Vacuum Cleaners"—discussion of types and ratings of 14 models.
"Miscellaneous Cameras and Photographic Equipment"—ratings of 4 miniature, 3 twin lens reflex cameras, 5 enlargers.
"Lens Shades for Cameras."
"Typewriter Ribbons"—22 listings.
"Paint for the Home, II"—listings of porch and deck paints and enamels.
Also reports on Babies' Rubber Pants, Women's Sew-on Garters and Sanitary Garments, Dictionaries and Children's Anthologies, Automobile Inner Tubes and Repair Kits, Whiskeys, and Rubber Heels.

A BIBLIOGRAPHY OF BOOKS ON CONSUMPTION, 1930-40—SPECIAL BULLETIN 28

Following an introductory discussion of some general questions relating to bibliography of literature in the consumer field, this bibliography provides lists of general textbooks for high schools and colleges, and supplementary books of direct consumer interest on such topics as "buymanship," consumer credit, consumer cooperation, population problems, budgeting, health and the consumer, consumers and the social order, wealth and income, and other subjects.

(Not Confidential) 20 pages (mimeographed) 20c

CONSUMERS' TEST MANUAL

For teachers of college and high school science classes who are interested in orienting their courses around consumers' problems, this Manual provides some seventy-five tests. Directions are set down in detail and lists of apparatus needed are provided. Included are tests To Distinguish Fresh Butter from Renovated Butter and Oleomargarine, for Gelatin in Ice Cream, for Starch in Face Powder, for Lead in Paint, etc.

(Not Confidential) 38 pages (including Index) 50c

Furniture—II

by M. M. Smith

This is the second part of an article on furniture by a recognized expert on furniture and its manufacture, who writes here under a pseudonym. This part deals with upholstered furniture. The first part, which appeared in the April 1941 Bulletin, dealt with the non-upholstered types of wooden furniture, known as case goods.

There has been a widespread lowering of quality of upholstered furniture in recent years. Constructions tried and true have been modified to reduce costs, and very often these changes have shortened the useful life of the furniture. The lowest-priced upholstered furniture often comes from poorly operated factories, employing unskilled labor on operations that were formerly considered to be in the province of the skilled upholsterer. Such furniture is never a good buy. On the other hand, there have been some developments of efficient structural units that really lend themselves to modern assembly-line methods of furniture manufacture.

Examination of the upholstered furniture that you consider buying should begin with the frame, both the parts that show, and the parts that are concealed and hold the piece together and give it strength and rigidity. Check the finish for flaws that are evidence of careless work and poor factory inspection. Turn the piece over to see whether the under parts are well made. See whether the legs are strong and the frame corner-blocked. Next, test the piece in an upright position to see whether any part of the frame sags or gives under your weight. Arms, knuckles (carved pieces of wood protruding from the arms of certain upholstered chairs), and back should be strong enough to resist reasonable stresses without sagging. In the case of a divan or lounge, lift one end and strain it in a way to see whether the frame is too easily twisted. Obtain the assurance of the store that all joints in the frame are double doweled, and have the statement in writing to avoid misunderstandings in the event it should later prove to be incorrect.

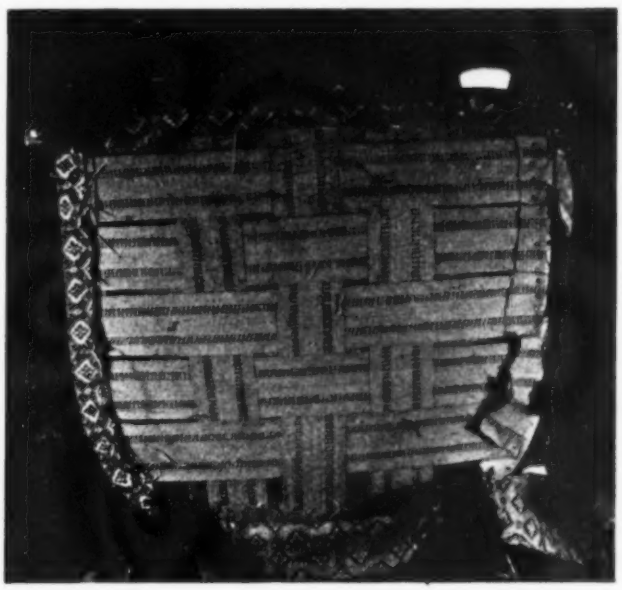


Fig. 1—Webbing strips, placed closely together, are the oldest and, many still believe, the best means of supporting the platform or seat springs in upholstered furniture.

Internal construction is almost impossible to determine on the floor of a store, but you can prod the furniture to establish certain facts. See whether the seat under the cushion, or "platform," as it is called in the trade, is level and supported by sufficient springs. Push down the edge of the platform, called the roll, to determine whether it has plenty of spring and good recovery. Feel the roll to see that it is well filled with substantial materials, and is firmly attached to the platform. Notice whether the platform has plenty of filling between the fabric and the springs; and while prodding, check the back for evidence of adequate support and sufficient filling materials. Note whether the arms are well padded. Be wary of sharp frame edges under the upholstery, since even the best fabrics will soon wear out if placed over hard edges.

The upholstery should be well fitted, with strong seams, neatly put together. Select your upholstery fabrics with great care. Mohairs, in general, are serviceable. Mohair-cotton blends are cheaper and give good service if there is enough mohair present to present a wearing surface. Rayon-cotton mixtures give satisfactory service in properly constructed fabrics. Tapestries made of this mixture are popular and will prove satisfactory if well made. Cotton homespuns are acceptable on low-priced furniture and will wear fairly well if the fabric has sufficient weight. In light colors, they tend to soil easily. Avoid, by all means, lightweight cotton homespuns; they are suitable only for one-season slipcover fabrics. These are often used on cheap maple furniture.

Ask the salesman about inside construction. You are entitled to a full description of the way the furniture is made. If the salesman doesn't know, you would do well to look up another salesman or another store because you have no hope of making a wise purchase if the man selling you the product does not himself know the details of con-

struction. Bottom springs are usually supported by means of webbing strips, by a single piece of webbing covering the whole bottom of the frame, or by one of several types of steel supports. Strips of webbing are by far the oldest type, and are good if properly used. Webbing strips should be placed not more than one-half inch apart and the ends should be folded over and tacked six or seven times. You can often look through the cotton muslin fabric on the bottom of the chair to determine whether this has been done.

Construction using a single piece of webbing to cover the bottom of the frame is the so-called "sagless" construction. It is superior to webbing-strip construction only when it is compared with a construction in which the webbing strips have not been properly used. The single piece of webbing fabric is reinforced by metal strips or wire, and the result depends upon how well these supports are designed. Unless webbing-strip and "sagless" constructions are both well made, sagging will occur in time.

Steel spring supports offer the advantage of being inexpensive, nearly sagproof, and usually very strong. The springs are fastened into steel wires or straps hung on the frame.

The tops of the springs must be held in their proper positions. The usual method is to tie the springs in position with twine. Italian twine, well glazed and tightly twisted, is best. The tops must be tied *at many points* to prevent them from slipping out of their proper positions and causing a deformed or unsightly platform. In cheap chairs, the maker has often tied the springs in four ways only and the result of this method is definitely bad. A six-point tie should be the minimum, while an eight-point tie is most desirable. Ask for a guaranty that the springs are actually *tied* at all points, and not simply looped. Looping, a speedup method employed by unreliable factories, is a common source of platform failure.

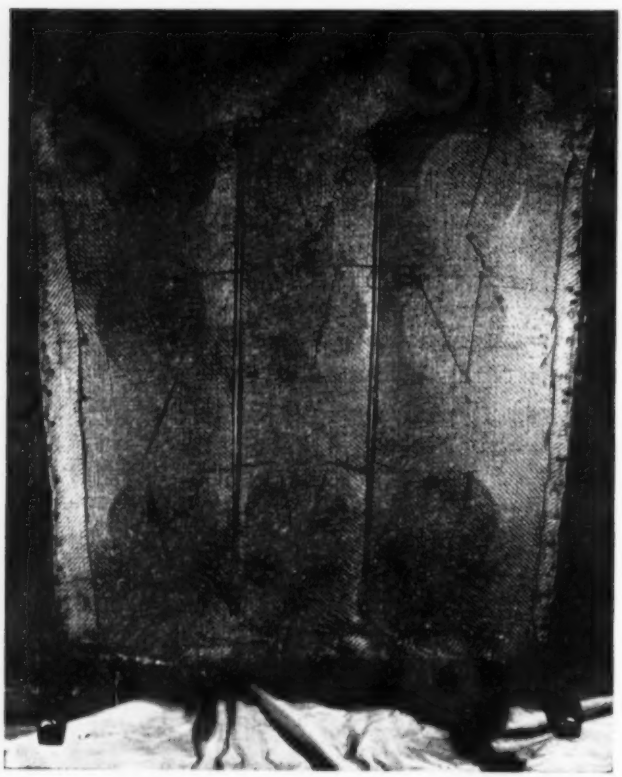


Fig. 2—"Sagless" construction as a means of supporting platform springs in upholstered furniture works well if the materials used are strong and properly related to each other.

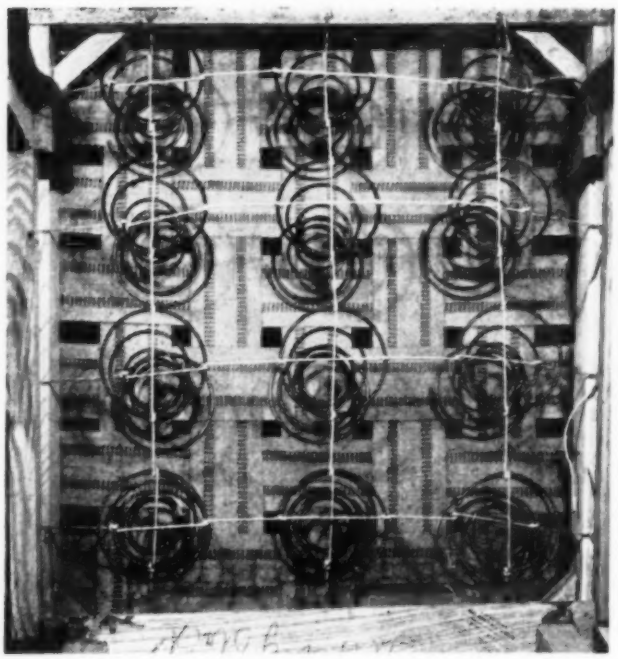


Fig. 3—The 4-point tie shown in the picture above is a poor construction, for it permits the springs to move out of position and it puts more strain on the twine than it can usually withstand. Note in the illustration that at some points, loops instead of knots have been used. This is an added element of weakness.

Another type of construction for both platforms and backs uses flat springs made of strong steel spring wire bent in a series of S's. The ends of the flat springs are fastened into the frame in a manner to make them bend upward or outward. This construction gives very satisfactory service except in instances where the springs break loose from the frame, as can happen occasionally. Its only disadvantage is lack of flexibility at some points, making for somewhat less seating comfort than the constructions using coil springs.

Most states require that the filling content be stated on a label attached to the furniture. Springs should be tightly covered with a strong cotton or burlap fabric. Outside of this, there is usually some sort of bulk fibrous padding material.[1] The best

[1] A more detailed discussion of filler materials is given in *Consumers' Digest*, April 1940 (15c from Consumers' Research).

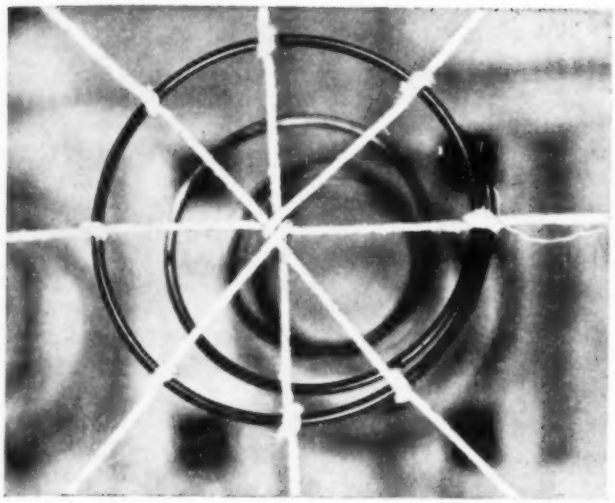


Fig. 4—Above is an 8-point tie. This design is well adapted to holding firmly and giving long service. Note that knots are used instead of loops where the twine is fastened to the spring.

material for this purpose is hair. Some cheaper chairs contain excelsior, which is definitely unsatisfactory. Various plant fibers also are commonly used; all are inferior to hair. Over the layer of filling or padding material, cotton felt is usually placed for the purpose of giving a soft feel to the material in immediate contact with the upholstery fabric. As previously stated, one should examine all parts of the furniture to make sure that adequate amounts of filling have been used. Corners and edges of the frame must be well padded so that the upholstery fabric never lies against a sharp or narrow edge.

Cushions often do not fit well. Prod the cushion to see whether the inside spring unit is full size and gives adequate support. Spring units for cushions usually come assembled either as a series of springs clipped together with framing wires, or as a series of springs in individual fabric pockets. Both types may prove troublesome. The chief cause of failure of the first type is loosening of the straight wires which frame the springs. These may slip, protrude through the cushion, and tear the fabric. The second type fails when the springs wear through the individual pockets. If the spring unit is undersized, there will be an excess of filling around the edges of the cushion.

A few words regarding the care of furniture may prevent some grief. Furniture is not made to stand rough treatment or severe variations in temperature and humidity. If it is pushed around or jolted, the glue joints may become loosened, perhaps causing irreparable weakening. It cannot be safely stored in either very damp or very dry places, or next to a steam radiator, or in bright sunlight without sustaining some possibly permanent injury. Furniture polishes can do harm through being exceedingly oily or by being left on the surface where the result may be to dull the finish permanently. Water is a common ingredient of furniture polishes and hence they may cause warping of the panels if allowed to enter the interspaces between panel edges.

In conclusion, note that both the buying and use of furniture call for care and attention to detail. Furniture wisely bought and carefully used and protected from abuse will repay one with satisfaction for many years.

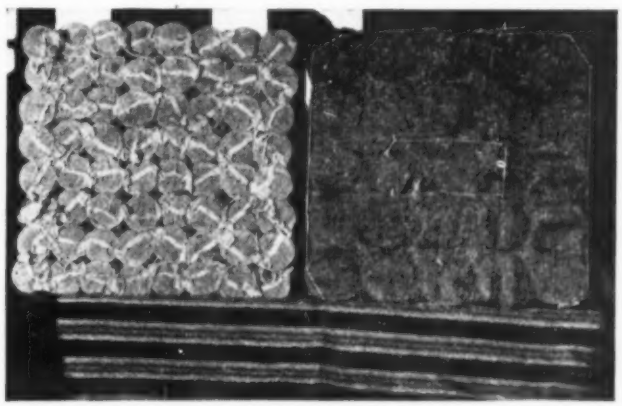


Fig. 5—In manufacture of cushions, spring units are covered with stuffing materials and placed inside of upholstery-fabric bags. The cushion unit illustrated on the left is not built for durability, for it uses light muslin covering for the springs. The one on the right has a heavy and durable burlap covering for the springs.

Chalks, Modeling Clays, and Colors

THE following products are an addition to those listed in "Chalks, Art Colors, and Paints," in CR's October 1940 *Bulletin*; they have recently been analyzed by the Industrial Hygiene Laboratory of the California State Department of Public Health, and have been found to be free from lead, arsenic, and mercury (any of which might be poisonous to the user of chalk, colors, or modeling clay).

B. Intermediate

Dovercliff, *Freart* No. 1534, *Hygeia*, and *Waltham* white chalks.

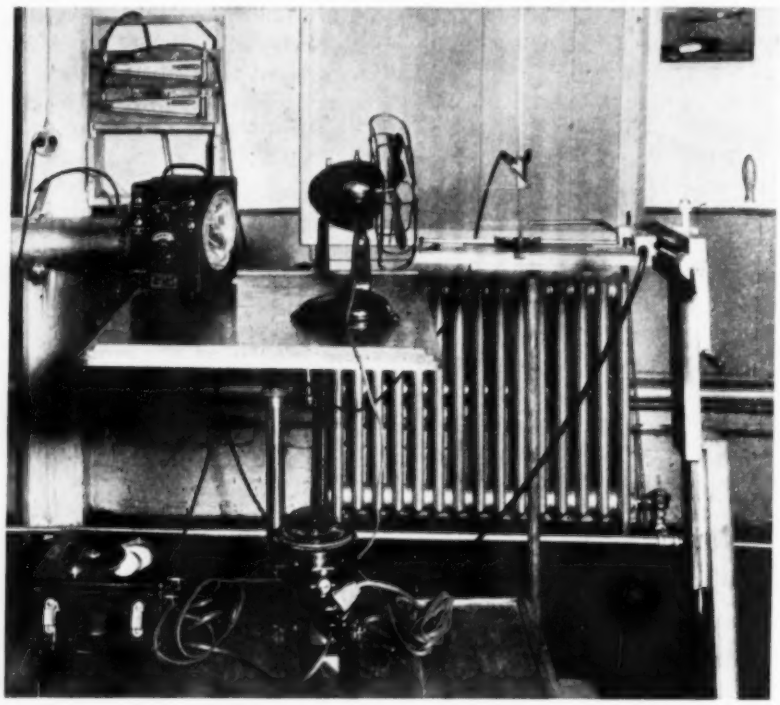
Formwell Plastic Modeling Clay, *Milo Plastic Modeling Material.*

Old Faithful Lecturers' Chalk.

Prang Powder Tempera Colors, *Prang Tempera Show Card Colors*, *Prang Water Colors.*

Electric Fans

NOWADAYS, when the streamline designers have given full sway to their caprices in reconstructing the outer shell, if not the inner mechanism, of so many modern electric appliances, almost all electric fans have come to look very much alike; there may be wide variations, however, between the different brands as regards cost of operation and amount of breeze produced. Thus, the cost for electricity to operate some of the least efficient of the 10-inch fans in CR's test, to produce a given amount of useful air-movement or breeze, would be from two to three times as much as for the most efficient ones. The operating cost of a fan is easily computed from the number of watts which it consumes, a figure given usually with sufficient accuracy in the manufacturer's catalog. Cost per hour is merely the number of watts divided by 1000 and multiplied by the price charged by the power company for a kilowatt-hour. At the rate of 5c per kilowatt-hour, 10-inch fans cost about 2/10 of a cent per hour to operate.



An electric fan under test. The apparatus shown is for controlling and measuring the electric potential (voltage) applied to the fan, for measuring the velocity of the air stream (one of the factors determining efficiency) by the impact-tube method, and for measuring accurately the speed of rotation of the fan blades by the variable-frequency stroboscopic-illuminator method. Additional apparatus consisting of a pendulum and torque-cradle suspension were also used in the tests, for measuring the thrust and torque exerted by air stream on the fan. These are not shown in the above illustration.

The *efficiency* of a fan is another question, for that expresses the amount of breeze produced in terms of electricity consumed, and it is important to note that a fan can produce a small amount of breeze and be relatively efficient, or a strong breeze and be very inefficient, depending upon the factors in its design that determine how well its electricity is applied to producing useful work. The design elements chiefly concerned are the fan blades and the motor. There are large differences between fans. Of late there has been a most creditable tendency among fan manufacturers to give figures for air delivery, in their catalogs, and these help the consumer who might be in doubt as to whether he should buy a certain fan at $9.95 or one at $13.95. As yet, however, figures of different manufacturers are not always on a strictly comparable basis, so that a comparison of fan outputs between fans of different makes may not be practicable. To illustrate how important it is that tests of corresponding items shall be on a comparable basis, we may mention that one fan, which was claimed to deliver 1650 cu ft of air per minute, was actually found in CR's tests to give less breeze-output than another fan which was claimed to deliver only 690 cu ft of air per minute.

Not only does the breeze given by a fan depend upon the design of the blades, but the noise does also. Many manufacturers offer two types of fans, (1) a standard type and (2) a quiet type, more expensive, and producing slightly less noise than the standard type, suitable for a study, library, or sick room. (It is said that people in some tropical regions like to hear a whirring sound from the fans and bore holes in the fan blades to increase the noise.) The fans with flexible rubber blades, included in this and in previous CR tests, have been found to be less efficient than those with metal blades (due in the present test to low motor efficiency rather than low blade efficiency). They are, however, less dangerous and certainly have their uses where the prying fingers of children need to be protected against rapidly whirling blades, at the expense of efficient use of current. As to this hazard, it may be noted that the larger and more powerful fans are distinctly more dangerous than the small fans, some of which will cause only slight damage if their blades come into contact with the fingers, through accident.

Oscillating fans are more desirable for most uses than stationary fans. The oscillating mechanism adds 20% to 40% to the first cost of the fan but a negligible amount to the operating cost. It should be a rule that whenever a non-oscillating fan is used, it should not be directed toward the body or toward any nearby surface in a manner to cause a steady flow of air toward the body, for the human temperature-regulating mechanism cannot function properly when a steady and continuous stream of air is directed upon the person.

[1] Not Confidential—Consumers' Research, Inc.

Twelve oscillating fans, all nominally 10-inch size (except *General Electric 55X165*, which had blades 8½ inches in diameter) and designed for operation on a-c only, were tested for efficiency in producing a breeze, for safety of electrical insulation, and for relative noise. All showed satisfactory performance in these tests except where otherwise noted in the listings. Cord lengths were measured; these varied from 64 to 98 in. Fans were also inspected for construction and quality of workmanship. All were purchased for test by CR with the exception of *Hunter Century*. This was lent by the manufacturer for the duration of the test and was selected by the maker at random from open stock. Ratings are cr41.

A. Recommended

Airflow, Sears-Roebuck's No. 315—5954. $7.95 plus postage. 110 to 120 volts. Off-high-low switch in base of fan. **2**

Diehl Junior, Cat. No. A10AJ17 (Diehl Mfg. Co., Electrical Div. of The Singer Mfg. Co., Elizabethport, N.J.) $9.95. 110 to 120 volts. On-off switch in base of fan. Over-all efficiency, 9.9%—highest of fans tested. **2**

Emerson Junior, Type 2650 (The Emerson Electric Mfg. Co., St. Louis) $9.95. 115 volts. On-off switch in base of fan. Over-all efficiency, 8.9%—second highest of fans tested. This fan's safety guard would afford poorer than average protection at rear of fan blade. **2**

General Electric, Cat. No. 78X829 (General Electric Co., Bridgeport, Conn.) $9.95. 110 to 120 volts. On-off switch in motor housing. **2**

R & M Banner, No. B10A6-O (Robbins & Myers, Inc., Springfield, Ohio) $9.95. 110 to 120 volts. On-off switch in motor housing. **2**

Wagner, Type 52601 (Wagner Electric Corp., St. Louis) $9.95. 115 volts. On-off switch in base of fan. **2**

Westinghouse Pacemaker, Cat. No. 10-B-3 (Westinghouse Electric & Mfg. Co., Mansfield, Ohio) $9.95. 115 volts. On-off switch in motor housing. **2**

General Electric, Quiet Type, Cat. No. 55X165 (General Electric Co.) $13.95. 110 to 120 volts. 8½-in. blades. On-off switch in base of fan. Was in fact relatively quiet in operation. Among the least efficient of the fans tested, but judged satisfactory for size of fan. **3**

Hunter Century, Cat. No. 75 (Hunter Fan & Ventilating Co., Inc., Fulton, N.Y.) $14.95. 110 to 120 volts. Off-high-low switch in base of fan. Safety guard gave better than average protection at rear of fan blade. **3**

Westinghouse Power-Aire, Cat. No. 10-A-3 (Westinghouse Electric & Mfg. Co.) $14.95. 115 volts. Was unusual in permitting a choice between two angular ranges of oscillation, but adjustment (requiring use of screw driver) somewhat difficult. Off-high-medium-low switch in base of fan. Produced most breeze of fans tested. **3**

B. Intermediate

Montgomery Ward's No. 586—5707. $5.95 plus postage. Rubber-blade type. 115 volts. On-off switch in motor housing. Rather skimped in cord length, which was only 64 in. Relatively quiet in operation. Second lowest in efficiency of the fans tested; might, however, be desirable for use where children must be protected from the usual type of fan blades (see text). **1**

C. Not Recommended

Montgomery Ward's No. 586—5706. $6.79 plus postage. 115 volts. On-off switch in motor housing. Rather skimped in cord length, which was only 65 in. Over-all efficiency of this fan in breeze production was lowest of the 12 fans tested. Safety guard gave better than average protection at rear of fan blade. **1**

WITH THE consumer now ready to believe almost anything he is told about vitamins and willing to assume that he is likely to fall into ill-health unless he takes the latest advice appearing in newspapers or popular magazines, it is reassuring to run across such a statement as the following, in a report of the Committee on Nutritional Problems, entitled "Extent of Vitamin Deficiency in the United States," which appeared in the *Supplement to the American Journal of Public Health, American Public Health Association Year Book, 1937-1938*, February 1938, p. 79: "It is generally agreed by experts that if half the caloric value of the diet were derived from milk, eggs, meat and meat products, fruits and vegetables, and if half of whatever cereal products are eaten consist of whole grain products, and furthermore, if there is sufficient exposure to sunshine to meet the vitamin D requirements, there will be no danger of vitamin or any other type of nutritive deficiency."

The report goes on to say that the further one deviates from these simple principles of food selection "and shifts toward the inclusion of greater amounts of refined cereal foods and sugar" the greater the likelihood that one "will eventually find himself in a twilight zone of malnutrition which will impair his health" and make him an easy prey to disease and ill-health due to external causes. The quoted paragraph furnishes almost all the guide that is needed to "successful eating," but it must be read carefully, for if any single one of the specifications (with the exception of the reference to milk) be deviated from significantly, there will at least be risk of dietary imbalance for the person eating the average or customary American type of meals. ¶This matter is briefly but clearly discussed in CR's September 1940 *ACB*, cols. 1-3. A fuller discussion (11 pages) may be had at 10c in cash or stamps, in the form of tear sheets of the Diet in General section from CR's September 1936 *ACB*.

The final paragraph of the report confirms a view which CR has long held and expressed, namely, that in case of doubt about one's diet, it is preferable to purchase more and better food rather than to attempt to supplement a diet lacking in vitamins and minerals by purchasing various concentrates and food supplements at the drugstore.

Stainless Steel Cooking Utensils

THERE IS no material that fulfills all the requirements for making an ideal cooking utensil. A cooking vessel, first of all, should not contaminate the food that is cooked in it. Although the average homemaker may give this point little, if any, consideration, it is outstandingly the most important requirement, for certain small metallic contaminations in food consumed over a period of time may cause serious chronic illness, especially when unusual circumstances combine to increase the contamination to abnormally high amounts. Besides being as free as possible from the hazard of contamination of foods and beverages, cooking utensils should be durable (resisting damage from falling, accidental impacts, and scouring), easy to clean, and capable of transmitting heat readily from the stove to the food.

Stainless steel vessels rank high in resistance to wear and tear, and in ease of cleaning. On the other hand, they are not good conductors of heat; and foods do tend to burn in them. From the standpoint of food contamination, moreover, many stainless steel vessels as now made are not fully satisfactory. On present information, we believe they are generally safe for foods other than those that are strongly salty or acid, and some stainless steel dishes must certainly, in CR's opinion, be considered unsafe for foods, such as sauerkraut, tomatoes, pickles, and probably for apples, peaches, plums, rhubarb, citrus fruits, etc. (The only utensils found by CR wholly or practically unobjectionable for all such foods are *Pyrex*.) Such foods may dissolve significant quantities of nickel,[1] chromium, and iron from stainless steel dishes. Many chromium compounds are definitely poisonous.

In CR's tests really large differences in resistance to chemical reaction were found. While samples of some brands were found to be quite resistant, reliance should not be placed upon continued uniformity in this respect, for at the present state of the art of utensil manufacturing, no certainty exists that a degree of corrosion resistance at present obtaining will continue in future production of a given brand (which may not, indeed, even be made in the same plant, or under the same degree of technical control, from year to year).

Any stainless steel utensil which has lost its original smooth interior finish, and so shows evidence of corrosion, should be discarded at once, as it is likely to contaminate foods with toxic metals to a dangerous degree. CR recommends also that stainless steel utensils be rinsed with particular care and thoroughness after being scrubbed with scouring powder, so that no particles of the metal abrased during the scouring process will get into the food that is next cooked in them. If any grayness or discoloration is imparted to a clean white cloth rubbed over a utensil, the rinsing has not been sufficient.

The belief that foods tend to burn more easily in stainless steel utensils than in some other common types of cooking ware was put to the test by CR. Food substances were cooked in glass, enamelware, aluminum, and stainless steel vessels of good quality. Cornstarch, potato starch, dextrin, casein, whole milk powder, and skim milk powder in water, were used. Skim milk powder in water was found to burn most easily and was then adopted as the test substance for the final comparison. In these tests, glass and enamelware utensils performed best, the aluminum dish was next, and the stainless steel dish poorest. The findings thus substantiated our earlier general observations. An enamelware dish of inferior grade was then tried. It proved to be worse as to burning-on of food than the stainless steel dish. The only difference found between a copper-clad and an ordinary stainless steel dish was that the food burned more uniformly over the whole bottom of the copper-clad dish, being more evenly heated.

In tests to determine comparative resistance of the various brands of stainless steel utensils to food acids and salt, a mixed solution of 4% citric acid (corresponding to cookery using citrus and many other fruits, including cranberries, quinces, tomatoes, currants, strawberries, etc.), 2% acetic acid (half-strength vinegar), and 2% salt was boiled in each dish for ½ hour. A reflux condenser was attached to the dish to keep the concentration of the solution constant during the test. At the end of the boiling period, the solution was analyzed for any nickel that had been dissolved from the utensils. In other tests on the same utensils, analyses were made for iron and chromium. Some of the dishes were noticeably damaged by the food acids, and considerable quantities of metal were found in the solutions—in one instance approximately *100 times as much was dissolved from the poorest dish as from the best one, under the same conditions*. Other utensils showed no visible effect, and only very minute quantities of metals were found to have been dissolved from them.

The following ratings are based upon relative resistance of the utensils to chemical reaction as determined in the tests just described. The ratings must be considered tentative in view of the fact that only one sample of each brand was tested and because no brand is believed likely to remain uniform over a period of time. (It would require many samples, purchased over a period of months from different sources of supply or in different cities, and a very large expenditure in chemists' analytical work in order to arrive at any surely representative determination of the performance of a given brand.)

[1] There are some differences of opinion about the toxicity of nickel. With respect to this metal, some authorities hold that it is relatively harmless and might be freely used in cooking utensils. On the whole, less toxicological work has been done on nickel than on most of the common metals, but it has been definitely related to the disease psoriasis. It has been found present in small quantities in a great many kinds of foods and beverages through its use, for example, in the hydrogenation of unsaturated vegetable oils to make the common household shortenings, and also through the extensive use of nickel-plated articles in pasteurizing and food and beverage canning and bottling plants. Nickel seems to have the peculiar property that after a sensitivity to it has once been developed or there has been an undue exposure to the substance, a peculiar susceptibility to skin diseases and disorders occurs. Slight apparent causes may produce the poisoning, e.g., contact with the frame or rim of spectacles of white gold containing nickel as an alloying metal; likewise, contact with wrist bands of wrist watches. Even the handling of nickel coins has been the cause of an eczema or allergic disturbances. It is said that 80% of the workers in nickel-plating plants suffer from nickel eczema or nickel scabies.

Prices of a number of brands are given in Canadian dollars, since the samples were bought for test in Canadian stores. To convert Canadian dollars to American dollars, multiply by ⅞ (approximately). Ratings are cr41.

B. Intermediate

Allegheny Lifetime (Stainless Steel Products Co., La Grange, Ill.) $3.95 (Canadian) for 1½-qt saucepan. Second best in small amount of corrosion by a solution of food acids and salt.

Bestmade Copper Clad, Sears-Roebuck's No. 11—4591. $1.49 postpaid for 1-qt saucepan. This sample, which was evidently made by Revere Copper & Brass, Inc., showed only about half the amount of corrosion shown by the sample of *Revere Ware Copper Clad*, thus indicating considerable variability between different products, or the same product at different times, of the same manufacturer.

Wards, Montgomery Ward's No. 89—3356. 89c plus postage for 1-qt saucepan. (Not listed in latest catalog.)

Revere Ware Copper Clad (Revere Copper & Brass, Inc., Rome, N.Y.) $5.50 (Canadian) for 2-qt saucepan.

Vollrath Enduro, S-117 (The Vollrath Co., Sheboygan, Wis.) $1.85 (Canadian) for 1-qt saucepan. Best in small amount of corrosion by a solution of food acids and salt.

C. Not Recommended

Carlton Ware Stainless Steel (The Carrollton Metal Products Co., Carrollton, Ohio) $2.15 (Canadian) for 1-qt saucepan.

Purity (Stainless Steel, Inc., Kewaskum, Wis.) $4.25 (Canadian) for 1¾-qt saucepan. Showed largest amount of corrosion by a solution of food acids and salt of 7 brands tested.

Babies' Diapers

DIAPERS ARE an important article of clothing which are bought for utility, like rubbers or shoestrings, without regard for their fashionableness of appearance. A plentiful supply is an absolute necessity for mother's peace of mind and baby's comfort. One eminent pediatrician, Dr. Franklin Cook, Evanston, Illinois, advised purchasing from three to six dozen. The minimum of three dozen is the amount which one can get by with if the baby's laundry is done every day. For the regular type, the most satisfactory size is the 20″ x 40″. No recommendations are made as to sizes of night diapers; these are not uniform as to type.

The method of washing diapers is important. A chlorine solution for sterilizing diapers is not recommended by medical authorities. Since the chlorine salts are rather strong chemicals, they might irritate the baby's skin if the solution has not been very completely and thoroughly removed from the cloth by rinsing. A simple and effective method of sterilizing the diapers is to wash them well in soap suds, rinse out the suds thoroughly in clear water, or in water to which boric acid has been added (6 teaspoonfuls of the crystal form per pint have been recommended), then boil the diapers. They should be dried in the sun if possible.

Diaper laundering services are a boon to those who can afford them and who live in cities where they are readily available. It is important, however, to ascertain whether the services which you contemplate engaging will contract to boil or steam-sterilize the diapers in addition to washing them.

Federal Specifications DDD-D-301 sets a usable standard for birdseye-type diapers, but standards for other types appear not to be available. In an effort to secure some practical information on the various factors, certain comparative tests were carried out on six well-known brands (two styles of one brand) for durability, drying time, shrinkage, ease of stain removal, and water absorption. In addition, observations were taken of the dimensions and weight of the various diapers, and use-tests on the specialty diapers—*Pantease* and *Vanta* night diapers—were made.

The diapers were made of four types of cloth: birdseye gauze, square woven gauze, birdseye cloth, and knitted fabrics. Stains on diapers in actual use have sometimes been found difficult to remove by ordinary home laundry methods. An attempt was made to stain each diaper in a manner corresponding to that acquired in actual service by placing them flat on a table and dropping 2cc of boiling yellow dye solution in the center. A control sample was dyed simultaneously, and the dye was not set in any way.

Differentiation as to ease of stain removal was impossible, as laundering entirely removed the stain from the surface of all the diapers. During the subsequent dissection of a *Vanta* night diaper for wear-test specimens, two very small light spots of color were observed. This would indicate some possible retention of stains by these heavy diapers when home laundry methods are used. Experience has shown that diapers laundered at home, using only soap and water with subsequent boiling, gradually grow dingy due to incomplete removal of stains. An occasional trip to a commercial laundry where the physical and chemical treatments are more severe than in the home laundry, as a rule, is needed to restore their whiteness.

Water-absorption rate was considered important, and in use tests it was found that two of the diapers when used as received and after they had been rinsed, shed or repelled water to a considerable extent. In such a case water would find its way to other clothing, bed linen, and pad. After being sent to the laundry, however, these diapers functioned satisfactorily in this respect.

The time required for the diapers to dry after washing was determined. Three samples of each brand were weighed dry and then rinsed in tepid water four times and wrung out by a power wringer. They were weighed periodically until constant weight was reached.

The method of final rating was based on lasting qualities as indicated by loss of tensile strength in laundering, drying time, shrinkage, rate of moisture absorption, estimated air permeability (which it is

desirable should be high), and special features. Ratings are in alphabetical order and are cr41.

A. Recommended

Chix (Chicopee Sales Co., 40 Worth St., N.Y.C.) $1.79 per doz. Birdseye gauze. Some loss of strength due to laundering. Drying time, normal. Shrank considerably. Absorption rate, next to highest for woven diapers. Air permeability, probably high. No woven-in guides for folding.

Pantease (Pant-Ease Infant Wear Co., Arcade, N.Y.) $2.25 per doz. Tubular rib knit night diaper. Appreciable loss of strength due to laundering. Required longer drying time than other diapers. Maker's instructions "to dry as a tube" could not be carried out without special hanging on line. Shrank considerably in length; shape was distorted by laundry handling; home laundering, without ironing, might eliminate this. Absorption rate, high. Air permeability, probably less than gauze diapers. The available sizes are 9" x 20" and 10" x 22½" (the latter was the size tested). Not adjustable as to size. Full absorption characteristics were not present when these diapers were new, but after laundering, trial users found them satisfactory. Elastic properties of rib knit material might mitigate chafing.

Vanta (Earnshaw Knitting Mills, Newton, Mass.) $1.79 per doz. Birdseye gauze. Least loss of strength of any diapers tested. Drying time, normal. Shrank considerably. Absorption rate, best of the woven diapers tested. Air permeability, probably very similar to *Chix*. Had woven folding guides, in colors.

B. Intermediate

Curity (Kendall Mills, Walpole, Mass.) $1.79 per doz. Some loss of strength when washed. Drying time normal. Shrinkage, least of gauze diapers. Absorption rate, lower than other gauze diapers. Air permeability, probably highest of all diapers due to less "linty" yarns. Had woven folding guides. Diapers of this brand purchased for these tests were found not to be cut with uniform selvage width.

Vanta Night Diapers (Earnshaw Knitting Mills) $6 per doz. Two layers of flat knit fabric padded with 2 layers of fleeced rib knit material. The outer, flat knit, material of the *Vanta* night diapers lost an appreciable amount of its strength when laundered. Drying time, under favorable conditions, over 3 hours. Shrinkage, negligible. Air permeability, probably poor due to multiple layers of material. Absorption rate, good after washing. Some traces of color were left in sample tested, indicating possibility of difficulties in stain removal in home laundering. Adjustable for increase in girth but not for length.

* * *

The two following brands were made of birdseye cloth, judged a less desirable type of fabric for diapers than gauze or the knitted fabrics.

Red Star, Montgomery Ward's No. 31—3154. $1.19 per doz plus postage. Appreciable loss of strength in wash tests. Drying time, normal. Slight shrinkage. Absorption rate, low. Air permeability, probably poor.

Roly Poly, Sears-Roebuck's No. 38—3050. $1.27 per doz plus postage. Appreciable loss of strength in wash tests. Drying time, normal. "Sanforized"; almost no shrinkage. Absorption rate, low (about the same as *Curity* and *Red Star*). Air permeability, probably poor.

Mattresses

What do you know about the "innards" of the mattress you intend to buy? Is your state one of the very few which have adequate bedding laws, coupled with competent enforcement? Do you know what to look for in judging good workmanship in a mattress? These are matters of concern to every purchaser of a mattress, and they are discussed briefly in this report, which deals with the two fundamental problems of mattress selection, namely, how *to choose a long-lasting mattress, on the basis of inspection, as well as definite information on materials, construction and workmanship, resilience, and buoyancy, and* which *mattress to choose, on the basis of technical tests of particular brands reported upon herewith.*

WITH THE exception of canned foods, nothing comes to mind at the moment which the consumer (or the retailer, for that matter) can buy with less assurance as to what's in it, than a mattress. The purchaser can't examine the interior of either product without spoiling the container. The trend toward grade labeling, together with the enforcement of the Food, Drug, and Cosmetic Act, is putting a more favorable face on the purchase of canned goods, but up to now, the little governmental protection that has been afforded the purchaser of mattresses has been scattering, incomplete, and more distinguished by its absence than by its availability in most states. Thirty-two states have bedding laws of one sort or another, but in only a few are the laws adequate, and in some of these enforcement is slack because of the habit the states have of not appropriating funds for the protection of ultimate consumers. Pennsylvania has both a fine law and conscientious enforcement. California, Connecticut, Maryland, and New York also have good laws and enforcement.

Mattresses have been an especially fertile field for misrepresentations of materials and qualities, and particularly of materials as new, when in reality the mattress contained old, used, or reworked fillers of all sorts, of nondescript origin and condition. The Federal Trade Commission has issued many complaints in this connection, but these must have represented, at most, only a very minute fraction of the total violations occurring, just as the prosecutions of the Food and Drug Administration are more symptomatic of bad conditions than any numerical measure of their prevalence. The best assurance the consumer has of purchasing mattresses satisfactory in quality is to buy those labeled to show compliance with the requirements of the states having adequate bedding laws and to buy from reputable dealers who are

known to stand behind the goods they sell even when the manufacturer does not do so—as often may be the case. As the springs fill up nearly all the center space in innerspring mattresses, adulteration of mattress fillings with insanitary, used materials is less apt to occur in the innerspring type than in those which are solid-filled.

There are three general types of mattresses: (1) solid-filled, with fillings of cotton, curled hair, or kapok; (2) innerspring, consisting of a center of springs with a layer of padding above and below; (3) rubber mattresses.

Of the solid-filled type, good hair mattresses are the most durable and for many years were the choice for domestic use as well as for high-grade hostelries. The wear-life of a hair mattress extends over many years, for it may be renovated repeatedly when it becomes flattened with use. In a much-used hair mattress, remaking must, however, be done every few years, and the process is expensive; this together with the very high original cost of hair mattresses has contributed to the rise in popularity of other types.

About 80% of the solid-filled mattresses sold are cotton. Those made of long-fibered cotton felted into layers prove satisfactory for many uses, but they are apt to be less resilient than the innerspring type, to become compressed, and to require remaking at intervals of a few years. Other types of cotton-filled mattresses, including those filled with linters (short fibers adhering to cotton seeds in ginning) blown into ticking under pressure, and the type with a loose cotton center between top and bottom layers of cotton felt, are judged inferior.

Kapok mattresses are comparatively light in weight and comfortable but are somewhat less durable than good cotton mattresses. Remaking is expensive. Frequent sunning and airing help to prolong their life. The necessary moving about of the mattress is no easy job for the housewife who isn't fairly active and muscular.

Innerspring mattresses outsell all other types at present and have become the preferred type for hotels as well as homes. They consist of a spring core covered with a layer of sisal or other protective material, with top and bottom pads of cotton, hair, wool, or air-foamed rubber. The hair pads are judged the most desirable but are the most expensive of the four. The spring unit may consist either of many small, separate, cloth-pocketed coil springs, or the springs may be woven together in a single unit, or tied together with metal clips or helical springs. Samples of each type have given a satisfactory account of themselves in CR's tests.

Rubber (latex foam) mattresses are of relatively recent introduction to the home trade but have been used successfully for several years in luxury trains, planes, hospitals, and buses. They are made of latex foam molded with large air pockets on the underside to give greater resilience, the top surface being smooth. For this reason they are not reversible. The one tested was provided with an easily washed removable cover. No one can say positively as yet how long these foamed-latex mattresses will last or whether they may, after some years, develop some defect or fault, such as an unpleasant odor, for example, and while there are accelerated aging tests that might be applied, such aging tests can never predict with any accuracy the time scale of deterioration of a new and unfamiliar material. However, the rubber-foamed mattresses do seem to give promise, and we believe that there is no exceptional hazard of their being depreciated at a rapid rate.

The person who is to sleep on it should decide how soft or how hard a mattress is desired. One manufacturer has even gone so far as to produce a mattress one-half of which is hard and the other half soft, so that two people who differ in their mattress requirements can both use it comfortably.

Appearance is of little importance where mattresses are concerned, for they are rarely seen except by the person making the bed. Hence most consumers will do well to choose a covering of the most durable type available in a given model of mattress. Ticking should be colorfast and durable. Good-quality cotton damask with woven-in design is almost as durable as striped ticking and is much more attractive. Cheap grades of art ticking with printed designs are ordinarily not colorfast; this type of mattress covering is not durable and should never be found on expensive mattresses. High-grade printed fabrics are colorfast and should give fairly good service.

Aside from these matters of more or less personal choice, the most important single property in a mattress is its resilience—its ability to "give" when a weight is applied and then to go back spontaneously to its original shape when pressure is removed. Buoyancy is another important property in a mattress; weight should be well supported without allowing the body to sink in too deeply. For many persons, it is vitally important that the mattress should be silent, producing no crunchings or bongs due to relative motions of internal springs and ties. Satisfactory workmanship is essential; this may be judged by observing firmness of tufting, finish of borders, etc. Edges finished with an inner roll and narrow binding strip are to be preferred to deep-rolled edges finished with a row of heavy stitching ¾ in. to 1 in. from the edge of the mattress. (In the latter, the fabric often tears where the heavy thread passes through, and the mattress becomes unsightly and ceases to be verminproof.) Firmly attached handles are necessary for frequent turning of the mattress. Ventilators are often included, though their usefulness is open to some question. If present, the openings should be covered not with a perforated disc but with a very fine mesh wire so that the entrance of vermin will be prevented (assuming that the mattress is elsewhere free from openings, e.g., around threads and handles).

Proper care will add many years to the life of a mattress. Air the bed well every day. Turn the mattress the day the bed is changed, being careful ***not to roll or bend it unduly***, especially if it is of the innerspring type. If any small defect or tear occurs, repair it promptly. A removable mattress cover protects the ticking and may be washed easily. Choose the proper type of spring for use with any particular mattress. Open-top coil springs can be safely used with solid-filled mattresses but are bad

for the innerspring type because individual springs in the mattress sink into the open spaces in the spring. The innerspring mattress requires either box springs or coil springs with platform tops (tops reinforced with interwoven metal bands). Slat springs, made of flat ribbons of steel with helical springs at each end connecting them to a metal frame, and link fabric springs are not durable and will soon damage an innerspring mattress.

Eight mattresses, representing 3 of the types just discussed, were tested by CR—6 innerspring, 1 cotton, and 1 rubber. All were subjected to 57,000 rollings under a 200-lb weight moving constantly back and forth for hours at a time. They were then observed and rated upon amount of sagging, bulging or general flattening, condition of cover, noise, hardness, general appearance, and whether or not they were judged to be verminproof.

Mattresses are of the innerspring type unless otherwise indicated. Ratings are cr41.

A. Recommended

Beauty Rest (The Simmons Co., Chicago) $39.50. "Guaranteed against structural defects for 10 years. Guaranteed as advertised in Good Housekeeping Magazine." Slight sagging in middle. Performed very well in machine tests, but several subscriber complaints indicate considerable variability in quality between samples. Handles not entirely satisfactory and showed signs of wear at end of test. 8 ventilators; construction, not verminproof. Quiet. **3**

Pilorest (S. Karpen & Bros., Chicago) $39.50. "Guaranteed by Good Housekeeping as advertised therein." Test performance, excellent. Condition at end of test, exceptionally good. Handles, satisfactory. 8 ventilators; construction, verminproof. Quiet. **3**

Spring-Air, Model 40 (Charles P. Rogers & Co., Inc., Div. of Spring-Air, N.Y.C.) $39.50. 15-year guaranty. Performance, excellent. Condition at end of test, exceptionally good. Handles, satisfactory, but openings where they were fastened to the mattress prevented the mattress from being rated as verminproof. Quiet. **3**

B. Intermediate

Wards National Quality, Montgomery Ward's No. 266—7724. $32.95 plus transportation. Condition at end of test, excellent except for very slight bulging at ends. Tufting was of a type that would permit fibers from the spring pads to work out onto the mattress surface. **2**

Sealy Tuftless (Sealy Mattress Co., Pittsburgh) $42.50 marked on mattress; price of $39.50 quoted by one furniture store. A solid-filled mattress alleged to be made of "all new. . .100% staple cotton" with fibers claimed to be especially interwoven to prevent mattress from becoming lumpy. (Numerous seed and other small particles were present in the cotton filling.) Suitable for use with good coil or box spring but not for link or fabric spring. Performance of mattress was good, but its resilience fell somewhat short of the innerspring type. Condition at end of test, good. Considerable damage had been done to fabric around heavy threads in deep-rolled edge in making and handling (see text). Handles, satisfactory. Quiet. Recommended only for dry climates as high humidity reduces its resilience. It is believed that for those who do not like innerspring mattresses, this mattress would warrant an *A* rating. **3**

U.S. Royal Foam Sponge (United States Rubber Co., N.Y.C.) $49.50. Latex foam mattress. Would rate an *A* on basis of performance and condition at end of test. Rated *B* only because of uncertainty as to durability and maintenance of its original qualities unimpaired through a long life. It is believed that these mattresses have not been widely enough used under diverse conditions in homes for a sufficient number of years to establish certainty of good durability. **3**

C. Not Recommended

Wards Standard Quality, Montgomery Ward's No. 166—8247. $12.95 plus transportation. Not listed in latest catalog. Workmanship, not first grade. Noisy. Not verminproof. Edges bulged, and condition was only fair at end of test. **1**

Sani-Sleep, Rubber-Tex, Sears-Roebuck's No. 1—7925F. $29.75 plus transportation. Innerspring unit with so-called *Rubber-Tex* foam pad on top. General appearance and condition of this mattress at end of test least favorable of mattresses tested; the pad had bulged beyond the spring unit at both ends, indicating probability of unsatisfactory wear-life. **2**

CR Can Often Help Army and Navy Purchasing Agents

TO THE EXTENT that our facilities permit, we are very glad to be of assistance to Army and Navy officers and government administrators in connection with the many new problems that are arising nowadays in the purchase of supplies, appliances, etc. A considerable number of subscriptions to CR's *Bulletin* are recorded in the names of officers and other executives in various military services and establishments and in governmental and military coordination and purchasing offices, and from time to time CR receives inquiries from them, on a wide range of topics, from selection of typewriter ribbons to the problem of specifying the most satisfactory outside paint for wooden surfaces.

On many of the subjects inquired about, CR's files yield valuable information. In those cases where actual data from our material and files may not be available or the subject itself happens to be beyond the scope of our investigation of products and services chiefly used by ultimate consumers, we can generally suggest reliable and useful sources of information, such as a state or federal government agency which has conducted research or issued publications on the particular subject matter, or some specially qualified technician or scientist in private or university employment who has expert knowledge and may be relied upon to furnish information that is unbiased and free from commercial prejudice or interest.

In any case, in so far as we are able to assist, we are glad to place our extensive knowledge of the techniques of selecting and testing consumers' goods at the disposal of officers in the Army, Navy, Marine Corps, and Coast Guard, of officers and civilian executives in schools, repair bases, and corps area headquarters, and persons in other military and related branches of federal and state governments who may ask our advice or seek sources of information in connection with their duties.

Fishing Tackle and Equipment

A Preliminary Approach to the Subject

FROM TIME to time, CR subscribers interested in the sport of fishing have requested that CR report on fishing tackle. Unfortunately, the testing of such equipment is beset with considerable difficulty, due largely to the fact that this is an entirely new field in the realm of consumer-goods testing, and standards or other criteria for setting up tests and judging test results seem not to be available. Moreover, no one of CR's staff, or among its numerous consultants, considers himself competent to set up, as yet, even tentative standards in this broad field. However, since a beginning must be made on all such problems, we are presenting at this time some notes and general recommendations gleaned from our file of letters from subscribers, giving the results of their long experience with fishing equipment. Some of the points may, of course, be open to argument. We hope subscribers may think so, for we invite criticism of this article, having in mind that in this way we may accumulate additional knowledge and opinions to enable us more effectively to test and rate articles used by fishermen. We ask, therefore, that those who are interested in fishing as a sport send us their criticisms, both adverse and favorable, of the following notes; we shall also welcome comments or information on other aspects not covered herein.

* * *

The methods most used by those fishing for sport are fly casting, bait casting, trolling with live or artificial baits, and still fishing. Generally speaking, the best equipment for any one type of fishing will not be equally suitable for another type. For example, a fly rod and tapered line are unsuited for trolling for muskellunge, and a bait-casting rod and 22-pound-test line are practically useless for fly casting.

Lines

A good line should be light, strong, and flexible. For casting, the lighter the line, consistent with good strength, the better. One experienced user reports finding satisfactory the *Pflueger Nonpareil* silk casting line of 18-pound-test, manufactured by Enterprise Mfg. Co., of Akron, Ohio. Nylon lines are not thought to be more durable than the ordinary silk lines, if the latter are properly handled and are dried carefully after use. Sportsmen should note, moreover, that Nylon is the name of the material from which the line is made and not all the fishing lines made of Nylon are necessarily first-class products. Nylon lines, therefore, should be bought from a reliable maker. When new, they are said to be stiff and to lack flexibility so as to require a breaking-in period. They have the additional disadvantage of being more elastic than the conventional silk lines. Because of this elasticity, if a plug should be caught on a lily pad, the tension on the line necessary to pull the plug loose may cause the plug to be thrown violently at the angler when it is freed. Some users think Nylon lines fairly satisfactory, and it has been asserted that they are resistant to rotting.

Some waterproofed lines, intended for use in bait casting, have been found by one user to give difficulty after a period of service, due to sticking of the line to adjacent turns on the reel. This causes difficulty with backlash, and it is considered that an untreated line, if properly dried after use, will give more satisfactory service than the waterproofed type.

Unless one plans to do enough fly fishing to warrant the additional expense, or is proficient enough actually to benefit by their use, the purchase of tapered lines is not recommended. However, if one wishes the best performance possible and is willing to make the additional expenditure to get it, he will find that a tapered line will tend to improve his casts.

To decide upon the size of line to use to the best advantage with any fly rod, the weight and spring of the rod itself may need to be taken into consideration, and the line selected that works best on that particular rod. This is necessary since rods vary in "backbone" or spring and thus no one size of line will work best on all rods.

Bait-Casting Reels

One of the most important pieces of equipment for the bait caster is his reel. Unless one wishes to equip himself for tournament or exhibition casting, he will do well to select a medium-priced, level-wind, "anti-backlash" reel. Many reels are claimed to be anti-backlash, but few are in fact. The *Pflueger* and *South Bend* reels costing from $10 to $20 are considered by some to be well-built, serviceable reels that can be used for a number of years if properly cared for. The *Shakespeare Wondereel*, selling at a substantially lower price, is said to be fairly satisfactory as to the anti-backlash feature, though the question has been raised by one correspondent as to its durability. The replacement of the reversing pawls on most reels having a level-wind mechanism may be necessary from time to time. These pawls are the fastest-wearing parts on level-wind reels, and it is a good idea to keep at least one, and preferably two, in your bait box at all times for replacement purposes. When a pawl does not function properly, it should be replaced at once to avoid injury to the spiral gear shaft of the level-wind mechanism. Good reels should be easily dismantled (and assembled) for cleaning or repair. *Shakespeare* reels have this good feature.

Avoid reels that lack adjustments at the end of the spool bearing. Such reels may serve well enough for trolling but are useless to the bait caster. Reels made with molded plastic cases are thought not to warrant recommendation on account of the ease with which they may be broken.

Bait-Casting Rods

As no group of fishermen will agree on the proper length of bait-casting rod to use, no attempt will be

made to recommend any particular length. In the opinion of one writer, a 5½-ft rod (used with a good reel) casts more easily and generally farther than a short rod. It also requires less effort since the spring in the rod helps do the work in casting. On the other hand, the 5½-ft rod will cause more backlash if the reel is improperly adjusted, and it can be broken more easily than a shorter rod in handling a big fish. Split bamboo rods are generally more expensive, shorter lived, and more easily broken than are steel rods. Bamboo rods are, however, usually somewhat lighter in weight, especially in the better grades. They may sometimes take a permanent set after being subject to heavy strains. Furthermore, they must be stored properly to prevent warping, must occasionally be revarnished, and must have the silk wrappings renewed from time to time. The one-piece solid steel rods are much cheaper and will stand more abuse. A good one-piece solid steel rod can be purchased for $4 to $8. Tubular steel rods of the seamless type are somewhat higher priced, are lighter in weight, and are considered by some to be no stronger than the corresponding solid steel rod.

Experienced fishermen have used and found satisfactory, *True Temper* and *Heddon* one-piece seamless tubular steel rods priced at about $12. It is also considered that the *True Temper* solid steel rods selling at about $5 are practically as good as the tubular steel types.

Lures and Plugs

In spite of recent reductions in price, most of the better-known makes of lures are still thought to be priced too high. However, the low-priced varieties such as are obtainable at most ten-cent stores are considered to be often poorly shaped, improperly constructed of inferior materials, and poorly finished. Evidence of poor construction is made known by such faults as paint chalking or peeling off, wood cracking or splitting, and hooks bending or pulling out of the wood. Hair and feathers, where used in the inferior lures, often are of poor quality or poorly tied. Poor construction of the lure often causes it to revolve continually, and due to lack of adequate swivels, causes the line to twist. Lures made by the Heddon, South Bend, Enterprise, and Creek Chub Companies are said to be well built, to be of good materials, and to hold the fish for which they were intended. They are expensive, however.

Fly-Casting Reels

In fly fishing, unlike bait casting, the reel is of little importance, except as a line holder. A cheap single-action reel obtainable at from 50 cents to $1 is suitable for the average fisherman.[1] Any expenditure over that amount is warranted only to secure some special weight or balance demanded by the advanced expert or professional. Automatic reels are being used by many fly fishermen, but some would not recommend their use. They are usually heavier than the regular reel and are likely to snap off the fly or even the rod tip if the control lever is touched accidentally. Moreover, once one has become accustomed to using an automatic reel, it is rather difficult to go back to the conventional type.

Fly Rods

One of the reasons given for the high cost of split bamboo fly rods is the amount of labor necessary to finish a fly rod with sufficient windings and line guides to assure even distribution of stress. The more expensive rods have many more windings and guides than the cheaper rods, and these extra windings and guides are thought to be partly responsible for their better performance. Until recent years it was not possible to buy a fly rod for less than $10, and consequently, fly fishing became an expensive sport. At the present time, however, split bamboo rods of fair construction, except for their lack of sufficient windings and line guides, can be purchased at most sporting goods houses, hardware stores, or from mail-order concerns, for $4 to $8. By purchasing a rod of this type and putting on the extra windings and line guides oneself, it is said one can have a satisfactory rod. The material required can be purchased from fishing goods stores for about 25 cents. It has also been suggested that a tubular steel rod should be considered when selecting a fly rod. Steel rods are relatively unaffected by changing weather conditions, have the necessary lightness and whip, can take more punishment than the split-bamboo types, and are not expensive.

Rods and Reels for Trolling and Still Fishing

In trolling, any quadruple-action, level-wind reel can be used. One of the level-wind reels selling for about $2 is as well suited as any. The level-wind feature is not essential, but is available so cheaply on reels of this price that its convenience should not be overlooked. Any rod to which the reel can be fastened securely will suffice. The rod, however, should be sturdy enough to handle the particular kind of fish for which you are trolling. The equipment used for trolling can also be used for still fishing from a boat. A good rod for trout fishing, still fishing, and trolling is the telescoping steel rod such as the *Bristol* (The Horton Mfg. Co.). Such rods can be bought with locking joints which keep the guides and reel in alignment at all times. The advantages of the telescope rod are that it can be carried assembled (with reel attached and line strung through guides); it can be easily telescoped (shortened) for trolling, fishing close, or carrying through the brush; it will stand considerable rough handling; and is not expensive. Beware of the telescope rods whose line guides or sections cannot be locked in some way or whose reel seat is of a flimsy pattern. If possible, try fastening your reel to the rod you anticipate buying to see how securely it is held. Reel locks consisting of a band and thumbscrew are not considered satisfactory.

Tackle Boxes

A number of objections have been advanced to the metal tackle boxes at present on the market. The main faults are their lack of proper arrangement, their tendency to rust lures, the absence of means for securely fastening tops, and the lack of strength in the lids to which the handles are customarily fastened. This last weakness causes the box to be difficult to open and close, due to bulging of the top

[1] One fisherman would place the price of a "cheap" reel at $2 to $3.50.

after being carried by the handle when heavily loaded. It is thought that the general run of these boxes are machinists' low-grade tool boxes sold as tackle boxes. Wooden baits cannot be properly separated and stored in them due to the poor arrangemant and size of the partitions. Furthermore, metal boxes have a tendency to "sweat," and thus the metal parts of the contents are often rusted. It has been suggested that one way to acquire a good tackle box is to construct one of waterproof plywood and arrange the size, fastenings, and partitions to suit your personal taste and needs. A box thus constructed should not give the difficulty which the metal boxes do from moisture condensation inside, and should be inexpensive.

Minnow Buckets

The stay-alive minnow bucket manufactured by the Shakespeare Co., is considered to be satisfactory. Its most outstanding feature is that it is not necessary to float it over the side of the boat as must be done with the conventional bucket. However, one fisherman thinks that the manufacturer's claims (for the length of time this bucket will keep minnows alive) are somewhat on the optimistic side.

Miscellaneous Equipment

Fish chains that lack an individual swivel for each hook are not considered satisfactory, since dead fish will have a tendency to drown other fish on the string if the chain is hung over the side of a slowly moving boat. The rolling of the dead fish entangles the others and causes the entire string to revolve, thus preventing the live fish from swimming in an upright position.

Leaders should be strong, straighten out easily, nd stay straight in the water. Synthetic leaders re thought to be better than the usual gut type although the cost is somewhat higher. The purchase of a poor leader is not good economy since, if the leader fails, one is apt to lose an expensive plug. Snap swivels that have a tendency to fly open when strained should also be avoided since this may happen when a large fish is hooked or if the bait is accidentally snagged.

For night fishing, the *Coleman* lantern is judged to be practical and efficient, but gasoline lanterns must always be used and tended by careful and responsible persons, for they frequently involve an extreme hazard from fire or explosion and the possibility of setting fire to camp or woods.

Safety

The question of proper dress for fishermen should be given considerably more thought than it has had heretofore. Extremely heavy clothing, tight-fitting breeches, high laced shoes, hip boots, numerous sweaters, etc., so handicap the wearer that in the event of falling into deep water he will be unable to help himself. Warm, loose-fitting clothing, all-wool underwear, wool shirts, woolen slacks, and leather or windproof jackets fitted with zipper fasteners should be worn where possible. Ponchos are more suitable than raincoats from the safety standpoint since they can be slipped off easily. Clothing that can be gotten off very quickly in an emergency is the kind to purchase for fishing.

Addresses of manufacturers of products listed in the foregoing article are as follows:

Creek Chub Bait Co., 146 South Randolph St., Garrett, Ind.
James Heddon's Sons, Dowagiac, Mich.
Shakespeare Co., Kalamazoo, Mich.
South Bend Bait Co., 865 High St., South Bend, Ind.
The Coleman Lamp & Stove Co., Wichita, Kansas.
The Enterprise Mfg. Co., Akron, Ohio (*Pflueger* products).
The Horton Mfg. Co., Bristol, Conn. (*Bristol* products).
The Makers of *True Temper* Products, Sporting Goods Div., Geneva, Ohio.

Preservative Treatment for Wooden Fence Posts

ANYONE who has to buy or install any considerable number of wooden fence posts will be interested in the free mimeographed bulletin *Tire-Tube Method of Fence-Post Treatment*, by R. M. Wirka, of the Forest Products Laboratory, Madison, Wis. The bulletin describes a zinc chloride solution treatment for posts to retard decay. Only posts that are thoroughly green can be impregnated with the preservative solution; the bark should be on them. Posts that do not have considerable sapwood will not be greatly benefited by the treatment; posts that have considerable sapwood (aspen, sap pine, etc.) may be made about as durable as good cedar posts used without treatment—good for 10 to 15 years' use or perhaps longer. Treatment with zinc chloride is less effective in retarding decay than the hot-and-cold treatment with creosote described in *The Preservative Treatment of Farm Timbers—Farmers' Bulletin 744* (5c from Supt. of Docs., Washington, D.C.), but it has the advantage of being cheaper and simpler.

Corrections to:

Consumers' Research Bulletin

Issue of March 1941

Page 24 Venetian Blinds (first column): The manufacturer of the *Kenway* Venetian blind, formerly Kenway Venetian Blind Co., as stated in the March *Bulletin*, is now Venetian Blind Mfg. Co., Kenway Division, Moline, Ill.

Issue of May 1941

Page 26 New Pamphlets on Home Lighting and Wiring: Through a printer's error, the number given for *Farmers' Bulletin—Electric Light for the Farmstead* was 1818. The correct number is 1838.